OCTOBER, 1952

World Petroleum

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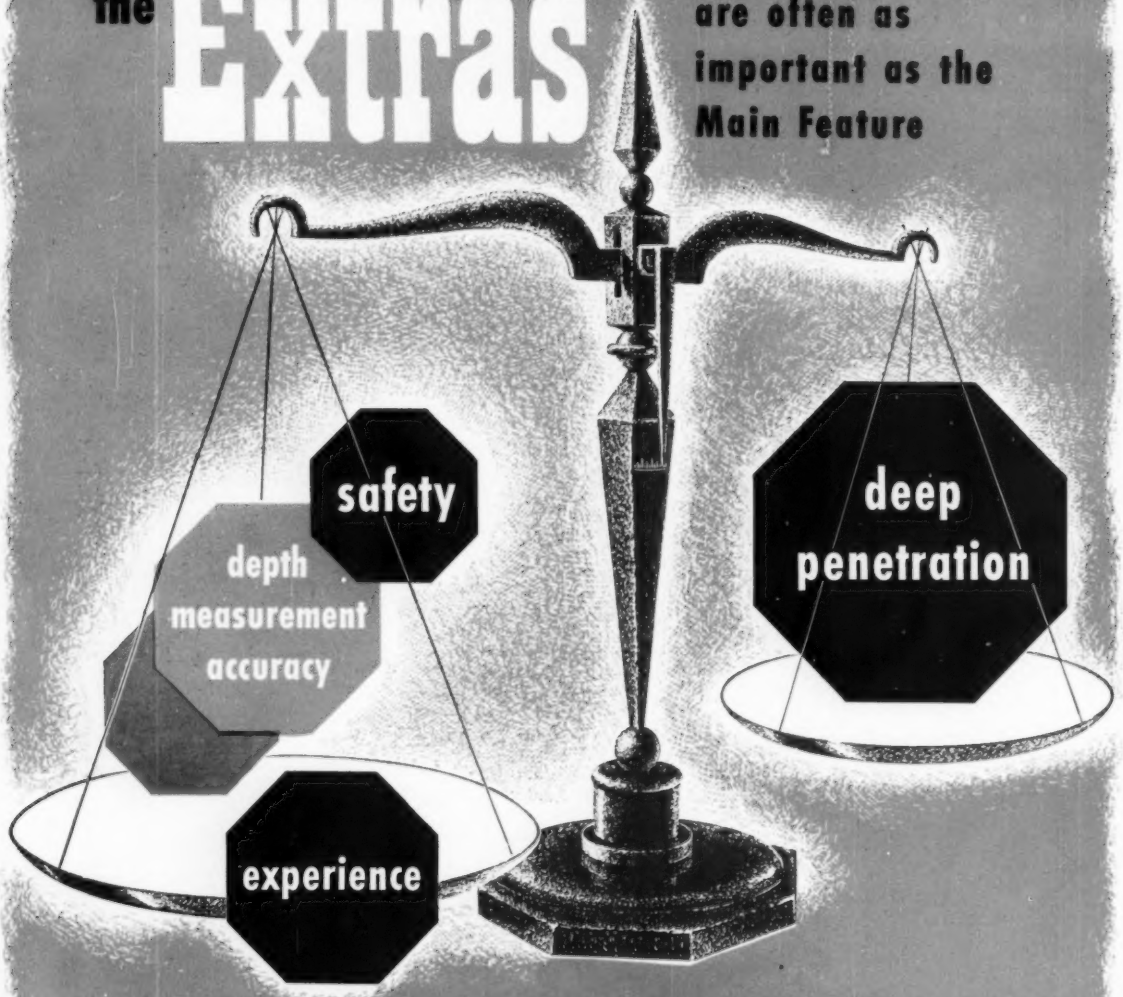
the Extras are often as important as the Main Feature



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the "plus-value" shaped-charge perforating

AK 500

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20 years of Progress Record Service

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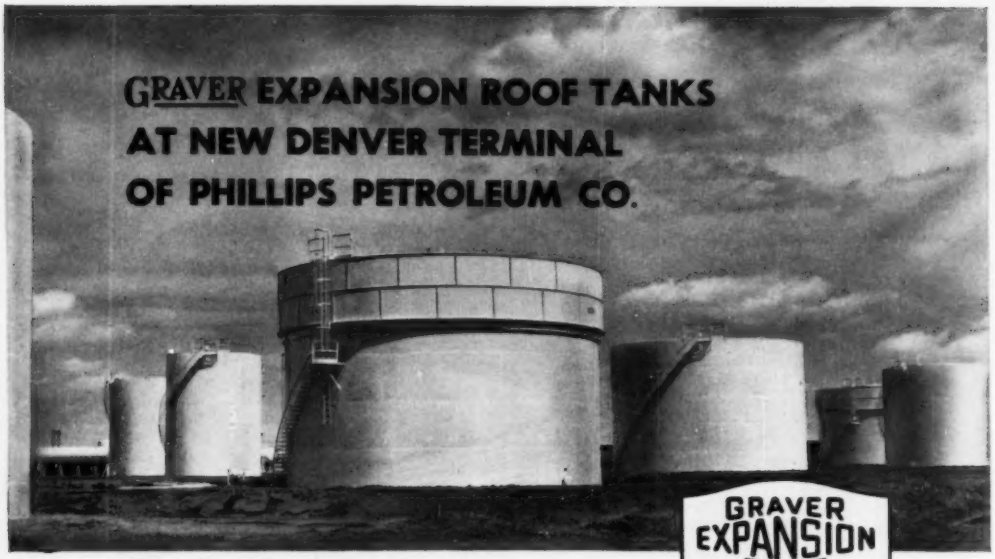
Unique

"Newallastic" bolts and studs have qualities which are absolutely unique. They have been tested by every known device, and have been proved to be stronger and more resistant to fatigue than bolts or studs made by the usual method.

C. P. Newall & Co., Ltd.

POSSILPARK GLASGOW · N



16 Graver Tanks comprise Terminus of new Phillips Pipeline

Graver supplied all the field-erected tankage for the Phillips Petroleum Company at its recently completed products pipeline terminal at Denver. The final step in a new 355 mile pipeline from the Texas Panhandle to the Rocky Mountain area, the terminal is equipped to handle the storage and distribution of such products as gasoline, aviation gasoline, L.P.G., kerosene and diesel fuels. The terminal receives approximately 5,000 bbls. of petroleum products each day.

A total of 16 Graver tanks are in service at the installation and have a total capacity in excess of 140,000 bbls. Conspicuous in this tankage are two 20,000 bbl. Graver Expansion Roof tanks, each equipped with a 10′ lift. Manifolded to these 60′ and 40′ tanks are a number of cone roof tanks, forming closed vapor systems. As the vapors from the volatile products stored within these cone roof tanks expand with increases in temperature, they travel through the vapor lines to the Expansion Roof tanks and the roofs rise to accommodate them. As the temperature drops, the vapors travel back to the cone roof tanks and the Expansion Roofs descend. As a result of the automatic action, all breathing losses are eliminated and filling losses minimized.

Thus, Graver Expansion Roof tanks are providing the key to the purpose of this new terminal—the delivery of a dependable year-round supply of refinery-fresh petroleum products to Phillips' customers throughout the Denver area.

GRAVER TANK & MFG. CO., INC.
EAST CHICAGO, INDIANA

NEW YORK • CHICAGO • PHILADELPHIA • WASHINGTON
DETROIT • CLEVELAND • PITTSBURGH • CASPER, WYO.
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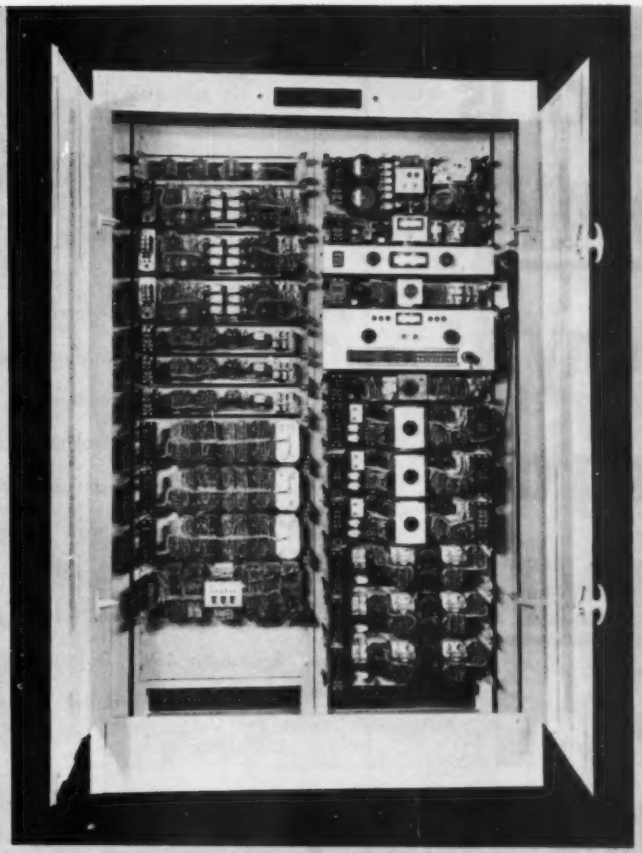

CABINET MOUNTED CARRIER TELEPHONE EQUIPMENT

This 3-Channel Carrier Telephone system on two short racks is assembled in a steel cabinet with lockable doors.
It is proving extremely useful for installation in buildings with low ceiling heights and the doors provide some security against wilful tampering. The equipment is complete with power supplies, testing equipment and alarm facilities.

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TELEPHONE: TEMPLE BAR 9262. CABLEGRAMS: STROWGEREX, LONDON

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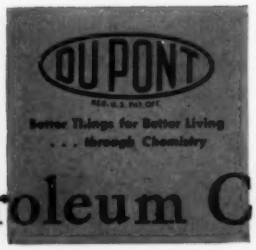
Q. Which is the ONLY company making a COMPLETE line of gasoline additives?

A. DUPONT is the only company making a complete line of gasoline additives! This line includes antioxidants, metal deactivator and gasoline dyes as well as tetraethyl lead antiknock compound.

Tetraethyl lead was first made commercially by a process developed by Du Pont in 1923 and, from that year until September 1945, Du Pont was the sole manufacturer of tetraethyl lead in the United States.

As in the case of TEL, all Du Pont additives are backed by a comprehensive technical service program. This program is brought to you by experienced representatives who are supported by the 5 thousand Du Pont personnel engaged in research and its administration.



Petroleum Chemicals

E. I. DU PONT DE NEMOURS & CO. (INC.) • Petroleum Chemicals Division, Wilmington 98, Delaware

A Program for 30 million new Americans

LISTEN to the voices of 30 million new Americans. They are answering the pessimists who say we are threatened with depression because we can't keep our farms and factories busy.

Let these pessimists read the future in the census returns. There is a tremendous upsurge in our population. Last year nearly 4 million babies were born. By 1960 we shall total 170 million people--30 million more than when war ended in 1945. This adds to our domestic market more people than there are in Canada and Australia combined.

Providing for these 30 million new Americans can keep our production machinery going at capacity. They call for new hospitals, schools and churches. Larger families need bigger houses to replace postwar houses that are too small now. More and bigger families need improved home equipment and more new automobiles. In short, to maintain and improve living standards for our children, we must work harder than ever before. To supply the needs of our 1960 population, including adequate national defense, it is estimated that the productivity of the individual worker must increase at least 30%, with additional investment of over 200 billion dollars in capital facilities.

There should be no room in this picture for depression. But we must have economy in government, elimination of waste and extravagance and a reduction of taxes and public debt. If we encourage private incentive, thrift and investment, we can bring about the greatest advance in health, wealth and happiness that America has ever known.

QUALITY V YOUNGSTOWN STEEL SERVICE

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
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MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

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NEW SERVICES • NEW TOOLS
NEW WAYS OF DOING THINGS

Latest News About New Tools, Techniques and Services

A BONUS OF 3472 B/D

BY USING McCULLOUGH GLASS JET PERFORATORS

THESE *TEN TOUGH WELLS →	X X X X X X X X X X	HAD A TOTAL PRODUCTION OF 602 BARRELS PER DAY
THESE SAME *TEN TOUGH WELLS WERE REPERFORATED WITH McCULLOUGH GLASS JET PERFORATORS →	X X X X X X X X X X	PRODUCTION JUMPED TO 4074 BARRELS PER DAY— A TOTAL INCREASE OF 3472 B/D — AN AVERAGE PER WELL OF 347.2 B/D.

*This is a matter of record. All ten wells had been previously perforated with little or no results. Then, they were reperforated by McCullough Glass Jet Perforators—production doubled, tripled, even quadrupled. Other operators have gained a production bonus—**so can you!**

The purpose of McCullough Glass Jet Perforators is to get more oil from your well. And they do . . . more oil through clean, full gauge, slug-free holes, deep into the formation. You get the power of the jet, plus the efficiency of the glass contained charge—harnessed to gain the kind of results you want—extra production—more oil.

So, call McCullough TODAY for the hardest shooting perforators in the world. Write for Bulletin #301.

PERFORATING, RADIATION LOGGING, AND FISHING TOOL SERVICE—ANYWHERE—ANYTIME.

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- halfway 'round the World
Quality fuels and lubricants bearing the famous Caltex name are at home on many highways throughout the Eastern Hemisphere. The familiar Caltex star says, "Welcome"—and Caltex petroleum products assure on-the-road efficiency for individual motorists, truck, bus and fleet operators.
CALTEX
PETROLEUM PRODUCTS
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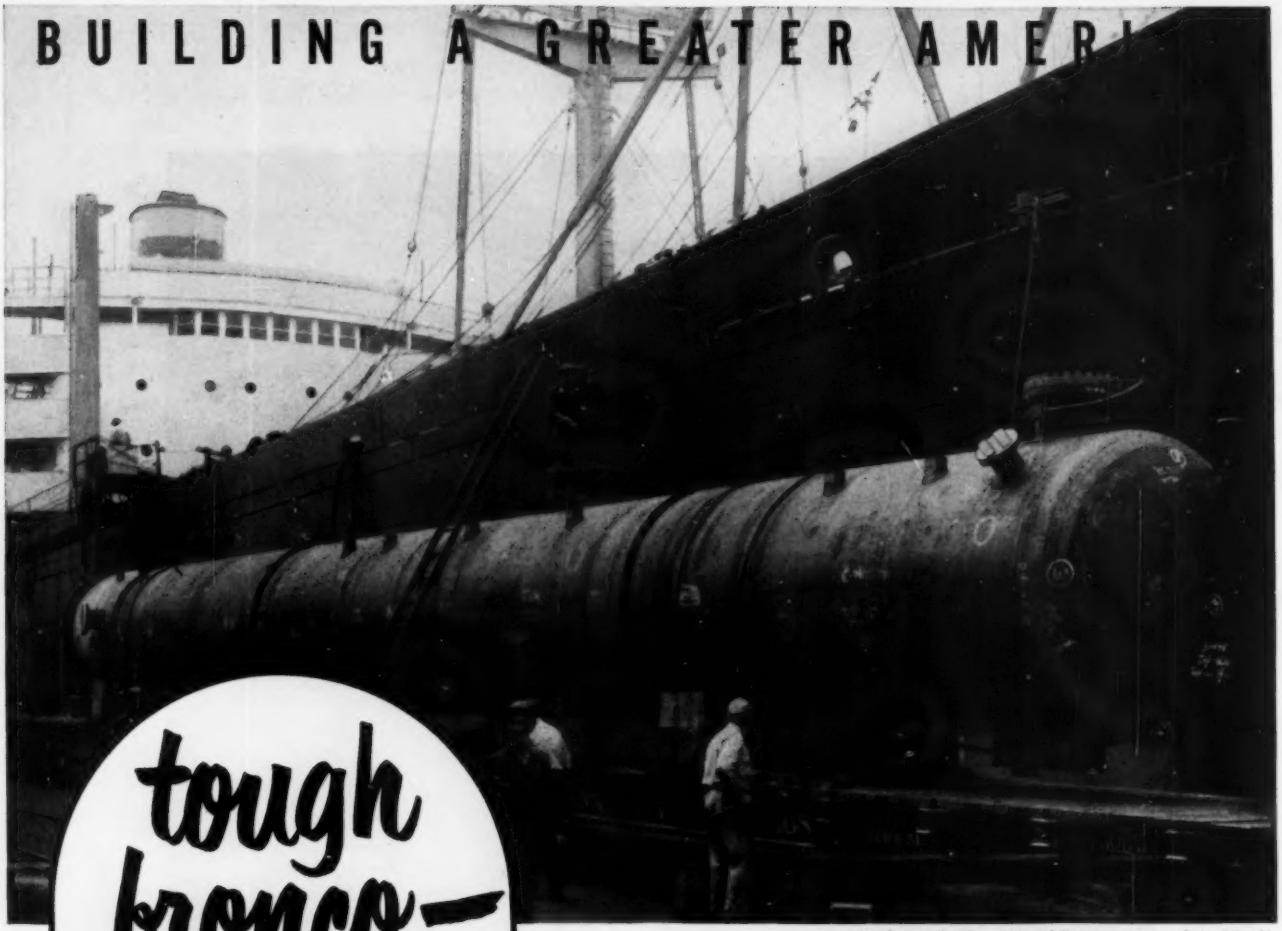

It took two railroad cars to provide "passenger accommodations" for this depropanizer tower—as Sun Ship workers readied it for shipment.

tough bronco— PETROLEUM!

Ever see a bronco at the first touch of the saddle? Ever see a gusher well come in? The resemblance doesn't end with the furious first burst of action, even though the saddled pony stands quiet . . . and the stream of black gold pours placidly into the refinery—until man renews his taming process.

Breaking a fractious horse . . . cracking petroleum . . . makes them both useful. And both tasks throw the full test of pressure on the men who tackle the job . . . and on the equipment they use.

Tanks and towers . . . in fact all refinery and chemical equipment built at Sun Ship has been meeting the toughest tests of pressure through years of service. That's to be expected. The men of Sun Ship who build it have shown their ability to meet and master the production pressure of time . . . and the engineering and shipping problems that go with the task of constructing and delivering the gigantic equipment that helps build a greater and stronger America.

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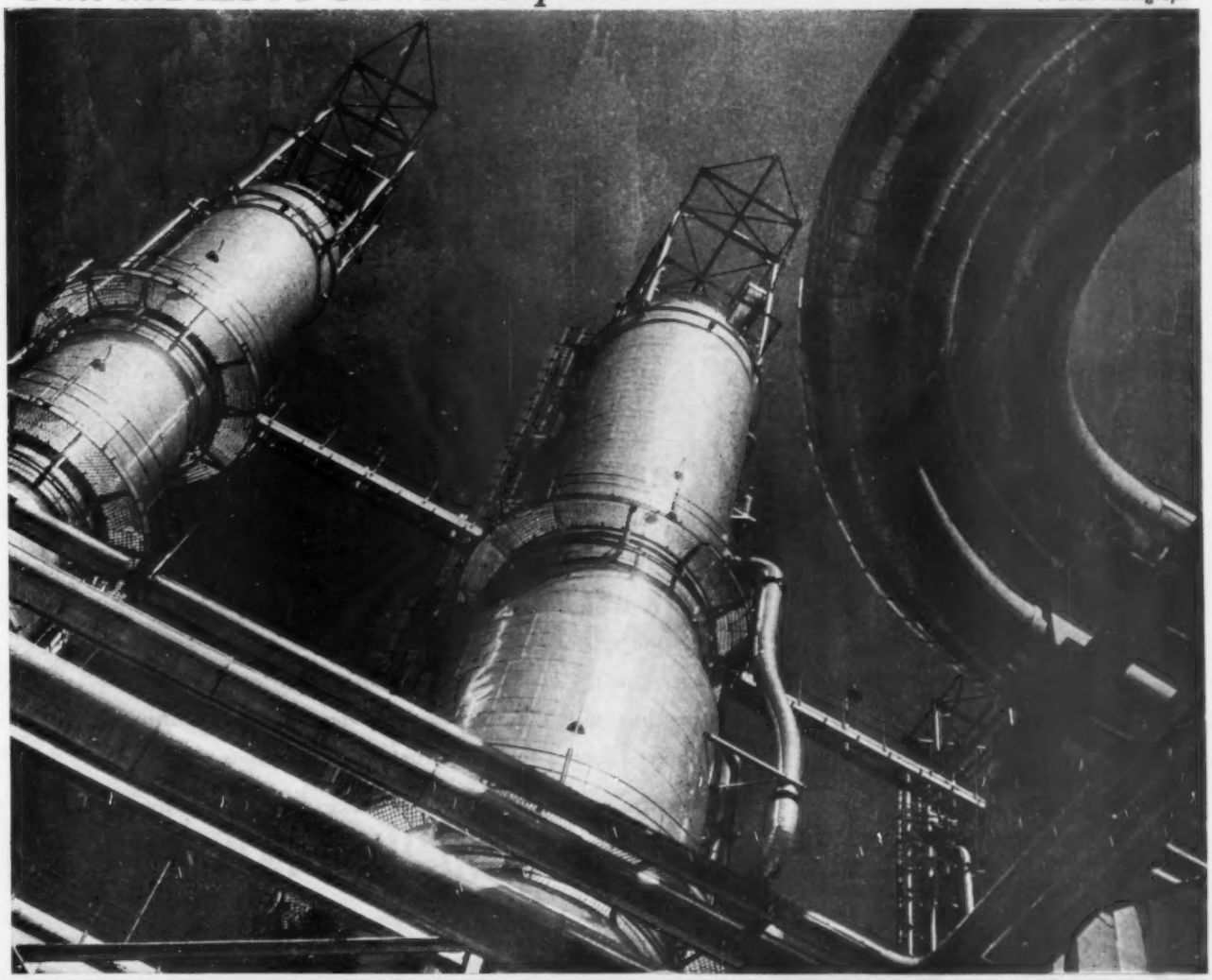
MORE NEED FOR—

KENYON
Planned HEAT INSULATION

Kenyon provide a *complete* thermal insulation service to the oil industry, including technical advice on thermal insulation specifications, and finishes for all conditions. Supply of materials, application, supervision, on sites throughout the world.
The photograph shows columns on the Distillation Unit, M.E.C. project, Shell Haven, England.

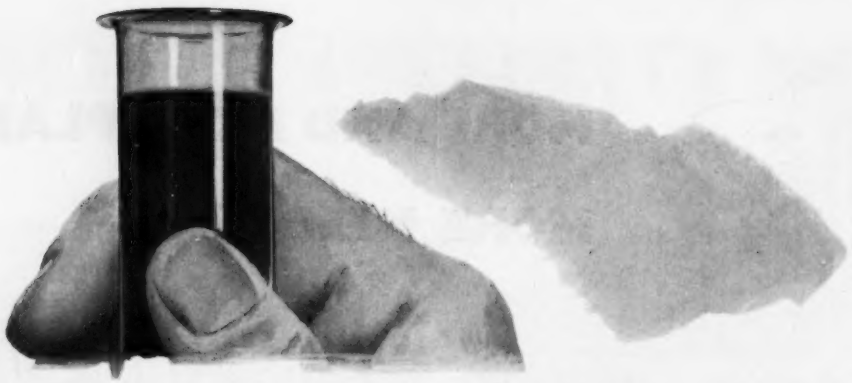
Call in KENYON to keep the heat in!

A Shell Photograph



WM. KENYON & SONS (AMERICA) LTD., PERTH AMBOY, N.J., U.S.A.

WILLIAM KENYON & SONS LTD., DUKINFIELD, CHESHIRE, ENGLAND



Live Oil Becomes Pipe Line Oil with

BREAXIT
REGISTERED U. S. PAT. OFF.

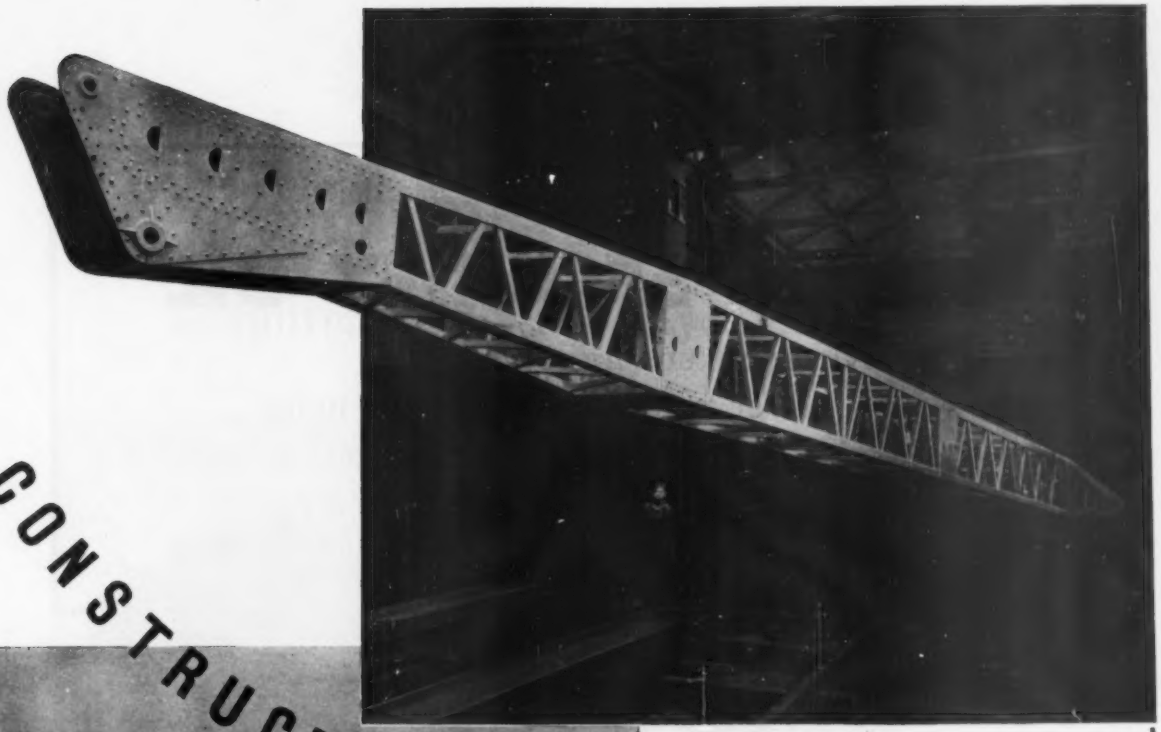
BREAXIT is an economical emulsion-breaking compound that converts emulsified oil to pipe line oil, assuring the most oil at the lowest cost per barrel.

A trained field-service engineer will make an on-the-spot test of the live oil your well is producing, then determine the *kind* and *amount* of Breaxit needed to give pipe line oil. This service provides you an emulsion-breaker tailored for individual well conditions.

Your nearest Breaxit distributor will make delivery to your lease.

BREAXIT is sold by

HUMBLE OIL & REFINING CO.
Houston, Texas



150ft. Mild Steel Riveted Derrick Mast photographed in the Butterley Constructional Department.

CONSTRUCTIONAL STEELWORK by

A view taken in the open before despatch.

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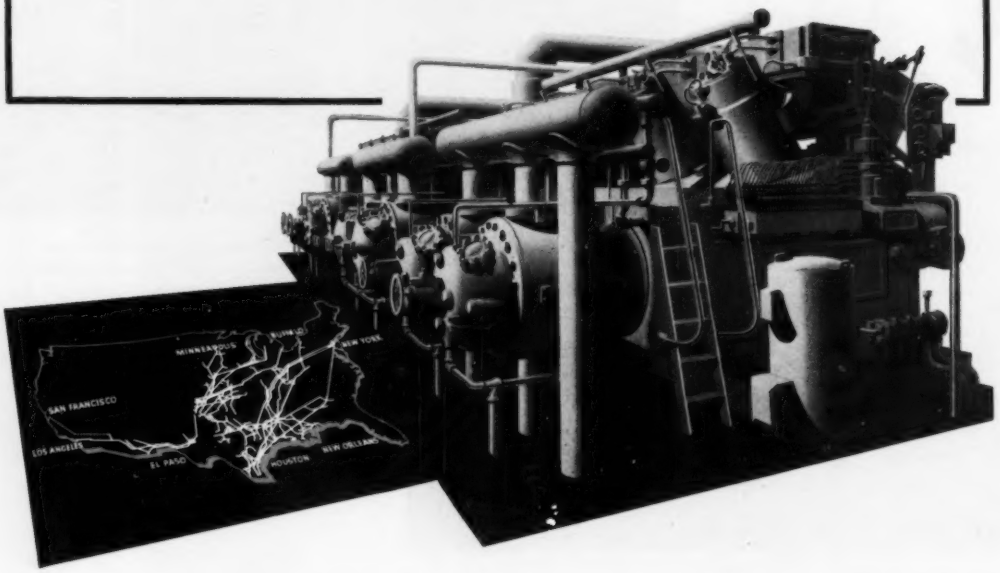
GULF SECURITY OIL

provides better lubrication
for pipe line compressor units,
helps prevent operating troubles



Here's the lubricant you can depend on to help keep your pumping stations operating smoothly and continuously—Gulf Security Oil. It provides effective protection for cylinders and bearings in both engines and compressors.

Because of its excellent resistance to oxidation, Gulf Security Oil stands up for many hundreds of hours without any appreciable change in its original properties. After years of operation with this quality lubricant, equipment shows remarkable freedom from cylinder wear and a minimum of carbon deposits on valves and rings. And because oil control rings are kept clean, oil consumption is remarkably low.

Operators of the many units lubricated with Gulf Security Oil report that this quality lubricant helps them get more operating hours between overhauls, and avoid unscheduled shutdowns.

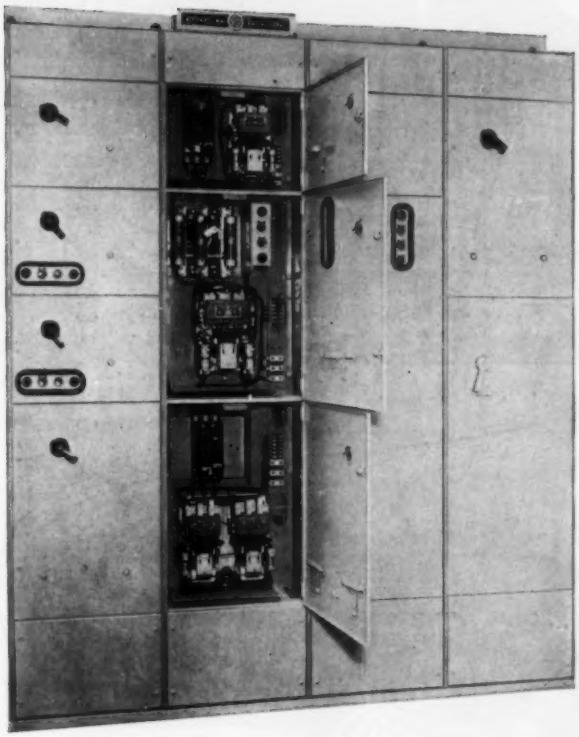
For additional information on Gulf Security Oil and for the services of a Gulf Sales Engineer, get in touch with your nearest Gulf office today. Write, wire, or phone.

Gulf Oil Corporation · Gulf Refining Company,
Pittsburgh 30, Pennsylvania.

GULF INDUSTRIAL LUBRICATION

New G-E MOTOR CONTROL CENTER

simplifies basic refinery operation



This new motor control center provides you with an efficient method of installing and servicing *in a central location* a-c combination motor starters, lighting, panels, and associated control equipment for a group of motors.

Check These Advantages

✓ **PROTECTED**—mechanically . . . against accidental blows, dirt and moisture. Electrically . . . against short circuit stresses up to 25,000 amperes.

✓ **VERSATILE**—because units are interchangeable . . . same door may be used for either fusible or air-circuit breaker types in the same sizes.

✓ **ACCESSIBLE**—removable units with components are mounted on sturdy lightweight frame.

✓ **STRONG**—because of "I-beam" construction of vertical sections . . . full length floor sills.

See your nearest G-E representative for more information, or write for FREE BULLETIN GEA-4979A: International General Electric Co., 570 Lexington Avenue, New York 22, U.S.A.

IA-53-6E

You Can Put Your Confidence In—

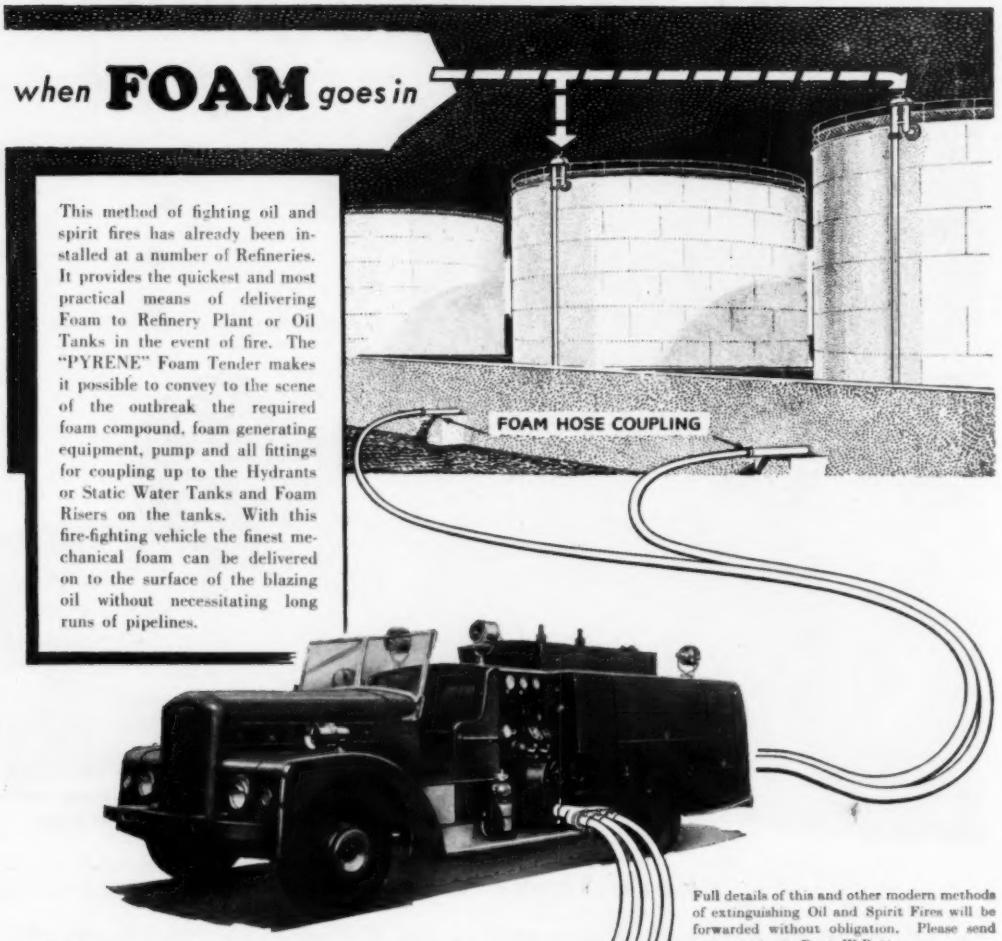
GENERAL ELECTRIC

—U. S. A.—

FIRE goes out...

when FOAM goes in

This method of fighting oil and spirit fires has already been installed at a number of Refineries. It provides the quickest and most practical means of delivering Foam to Refinery Plant or Oil Tanks in the event of fire. The "PYRENE" Foam Tender makes it possible to convey to the scene of the outbreak the required foam compound, foam generating equipment, pump and all fittings for coupling up to the Hydrants or Static Water Tanks and Foam Risers on the tanks. With this fire-fighting vehicle the finest mechanical foam can be delivered on to the surface of the blazing oil without necessitating long runs of pipelines.



This particular "PYRENE" Foam Tender carries 600 imperial gallons of "PYRENE" Foam Compound. Two No. 20 and one No. 19 "PYRENE" Mechanical Foam Generators and four F.B. 10 Portable Foam Branchpipes. It is capable of producing 4,500 imperial gallons of Foam per minute for 30 minutes without replenishment.

Full details of this and other modern methods of extinguishing Oil and Spirit Fires will be forwarded without obligation. Please send your enquiry to Dept. W.P. 10.

Pyrene TRADE MARK
FIRE FIGHTING EQUIPMENT

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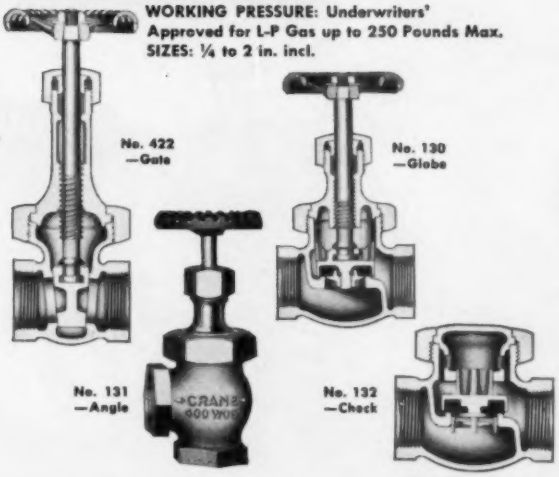
Head Office and Works: Great West Road, Brentford, Middlesex.
Associated with: — Pyrene Manufacturing Company, Newark, New Jersey, U. S. A. and Pyrene Manufacturing Company of Canada, Limited, Toronto, Ontario, Canada.

For BIG Selection in L-P Gas Piping Equipment See the CRANE Line First

BRASS VALVES



WORKING PRESSURE: Underwriters' Approved for L-P Gas up to 250 Pounds Max. SIZES: ¼ to 2 in. incl.

No. 422 —Gate

No. 130 —Globe

No. 131 —Angle

No. 132 —Check

Globe and Angle Valves have composition disc with easy-to-change slip-on disc connection.

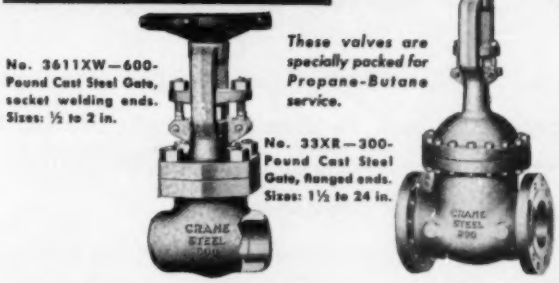
For producer, distributor, and large user—for every need in L-P Gas handling—Crane is where you get the BIG selection of quality piping materials.

You'll have your choice of valves, pipe fittings, and unions in service approved design, in brass, steel and iron.

With the help of Crane Co.'s accurate service recommendations, you'll enjoy maximum safety and dependability in L-P Gas piping, with low ultimate piping equipment costs. With Crane Quality in every item, you'll be protected against high maintenance expense.

See the big selection you get—in your Crane Catalog, or talk it over with your local Crane Representative.

STEEL VALVES



No. 3611XW—600-Pound Cast Steel Gate, socket welding ends. Sizes: ½ to 2 in.

These valves are specially packed for Propane-Butane service.

No. 33XR—300-Pound Cast Steel Gate, flanged ends. Sizes: 1½ to 24 in.

FITTINGS AND UNIONS

No. 198E—300-Pound Malleable Iron Female Union. Sizes: ⅛ to 4 in.

No. 260E—300-Pound Malleable Iron 90° Elbow. Sizes: ⅛ to 6 in.

No. 1240—2000-Pound Forged Steel Socket Welding Elbow. Sizes: ⅛ to 4 in.

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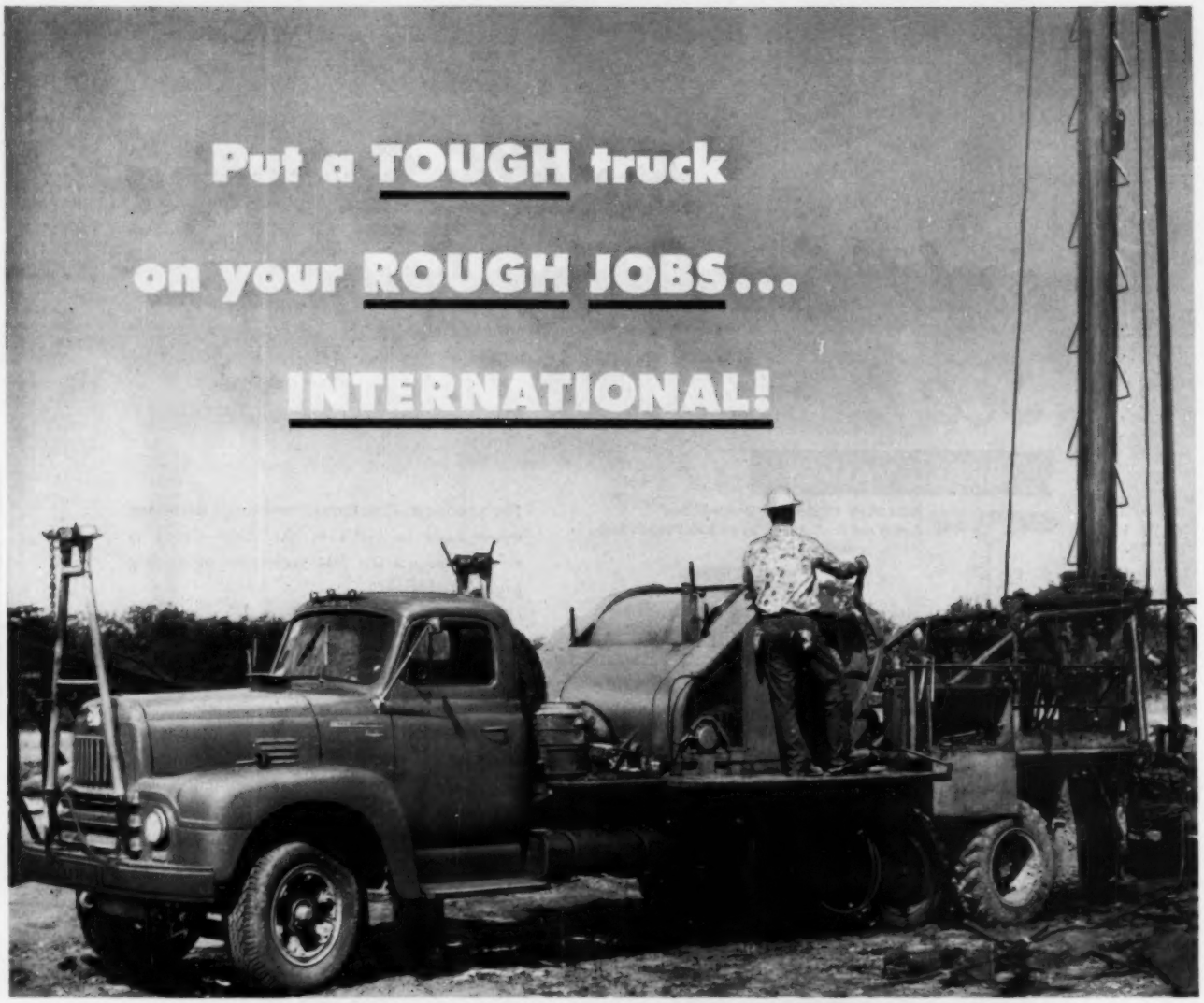
VALVES • FITTINGS • PIPE • PLUMBING • HEATING



Model LF-190, 157 in. wheelbase, 30,000 lbs. gross vehicle weight, with Franks 87-TM unit pulling tube from well.

• The oil industry may be a tough taskmaster, but not tough enough to lick International stamina and performance on or off the road. Hauling the heaviest type of gear, an International Truck is a bargain because it's Heavy-Duty Engineered for the job.

Look into the facts on International features: All-truck engines, exclusively for truck work . . . traditional truck toughness that has kept International a leader in the heavy-duty field for 20 years . . . 115 basic models, from the smallest pickup to giant six-wheelers.

Now, for more reasons why so many Internationals are working on the tough jobs see your International Truck distributor.

INTERNATIONAL HARVESTER EXPORT COMPANY

World-wide distributor of products manufactured by the International Harvester Company in the U.S.A. and by affiliated subsidiaries in Canada, the United Kingdom, France, Germany, Sweden, Mexico and Australia.

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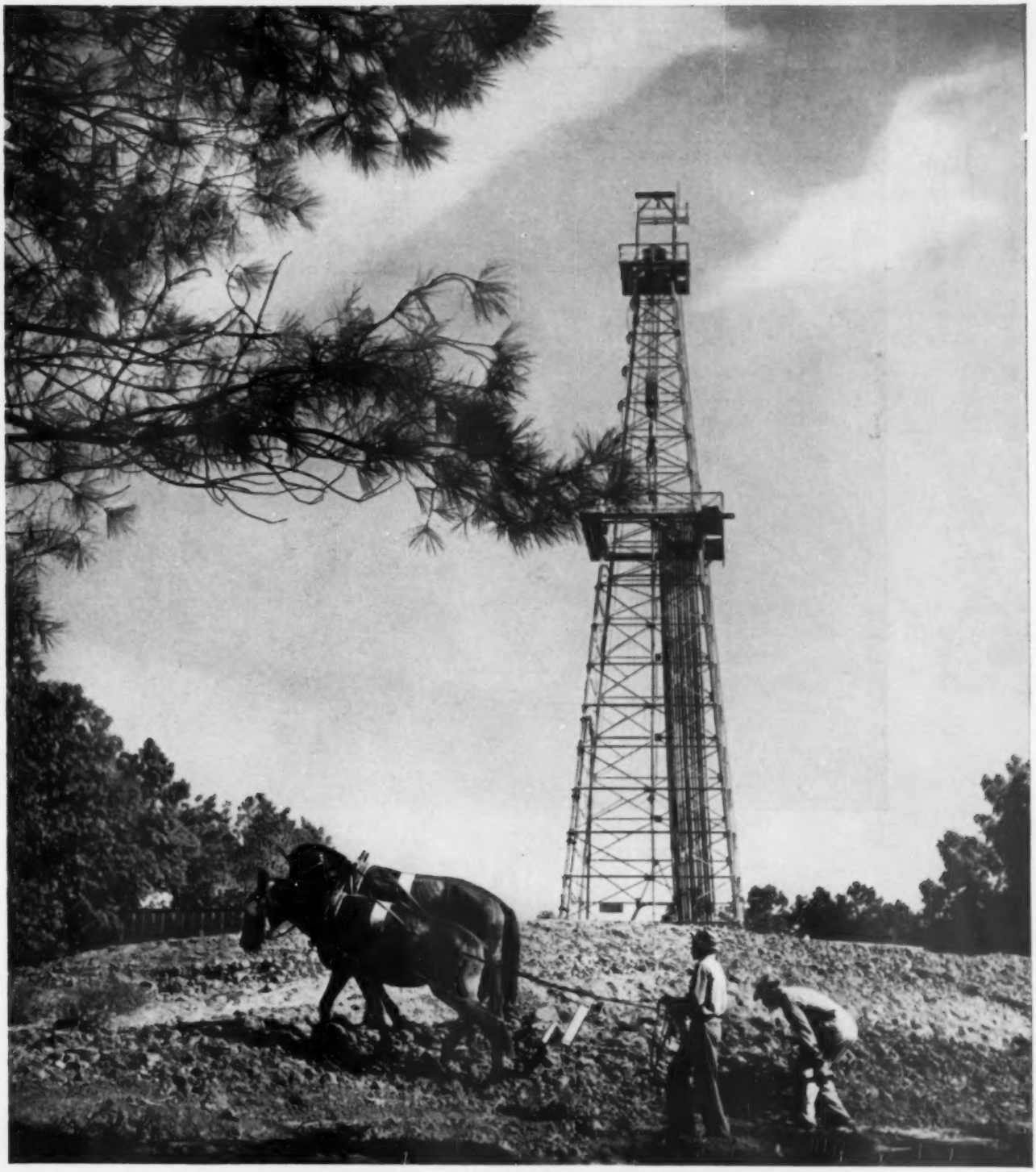
INTERNATIONAL INTERNATIONAL **TRUCKS**

Better Living through Better Roads



"Like a plant that takes nourishment from the soil and then replenishes it, a good investment is both productive and helps to enrich the soil itself—it contributes to the economic strength of the nation where the investment is made."

STANDARD OIL COMPANY (NEW JERSEY)

AND AFFILIATED COMPANIES

DRESSER
MANUFACTURING
DIVISION
IS ONE OF THE DRESSER INDUSTRIES

Dresser Manufacturing Division has grown up and expanded with the gas and oil industries. Dresser Couplings, the first leakproof pipe joints, made possible the high pressure transmission of gas over long distances. Dresser's complete line of couplings, repair clamps and sleeves, and welding fittings are specially designed to meet requirements of these industries.

Magnet Cove Barium Corp., *Houston, Texas.* Complete drilling mud service for the oil industry through 350 dealers at strategic locations.

Clark Bros. Co. Division, *Olean, New York.* Engines and compressors—gas, steam and diesel driven. ◣ Slush pumps.

Dresser Manufacturing Division, *Bradford, Pa.* Pipe couplings, fittings and sleeves—rolled and welded rings—welding fittings and flanges.

Kobe, Inc., Division, *Huntington Park, Calif.* Complete hydraulic oil field pumping systems, including the Kobe Free Pump.

No. 3 in a series about Dresser Industries

What is DRESSER INDUSTRIES

Dresser Industries, Inc., is a group of companies under common ownership with a single common interest . . . to serve the oil and gas industries with a wide range of the finest equipment and supplies possible.

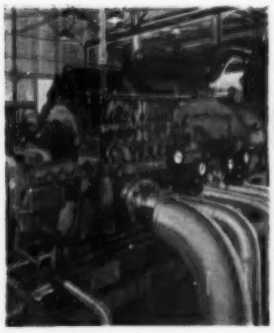
Each company is a specialist and recognized leader in its field, yet each retains its corporate identity and management. The pooled resources of engineering know-how and research facilities of the entire Dresser Industries organization back each company.

Individually or collectively, the Dresser group works in all its divisions helping to expand oil and gas facilities to meet the world's ever-increasing energy requirements. It is this planned association of companies and products that gives breadth and depth to Dresser's combined operations. This integrated line of equipment and coordinated service enables Dresser Industries to make *your* job easier and better.

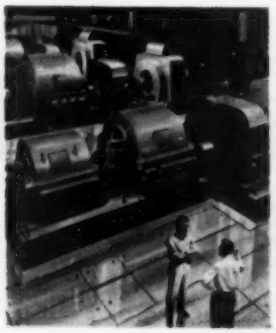
Gas utilities and pipelines use Dresser Products as standard practice in the installation and maintenance of their underground lines. In the oil fields, Dresser Couplings and long sleeves are widely employed on pipelines, field and tank connections, machinery and equipment hookups. DRESSERTAPE is a new plastic coating for the protection of pipe against corrosion.

DRESSER INDUSTRIES, INC.
OIL, GAS AND CHEMICAL EQUIPMENT

ATLANTIC BUILDING ★ DALLAS, TEXAS



Pacific Pumps, Inc., *Huntington Park, Calif.* Centrifugal pumps, deep oil-well plunger pumps and boiler feed pumps.



Roots-Connersville Blower Division, *Connersville, Ind.* Rotary positive blowers, gas pumps; centrifugal blowers, exhausters; positive displacement meters.

Security Engineering Division, *Whittier, Calif.* Rock bits, reamers, casing scrapers, reamer rock bits, coring bits, securaloy.

Ideco Division, *Dallas, Beaumont, Tex., Torrance, Calif.* Derricks, drawworks, rambler drilling rigs, traveling blocks, rotary tables, swivels.

M-58 Bethlehem's powerful drawworks for medium depths

Here's a rig that was many, many months in the development stage—a rig that meets a wider range of drilling conditions than anything we have ever before offered in its class.

The M-58 is designed for depths ranging from 5000 to 8000 ft. with 4½-in. drill pipe. It's powerful. It's flexible. It permits great latitude in the choice of engines and engine combinations. There's never been a rig of its size that could be moved so easily, so quickly, from one job to the next.

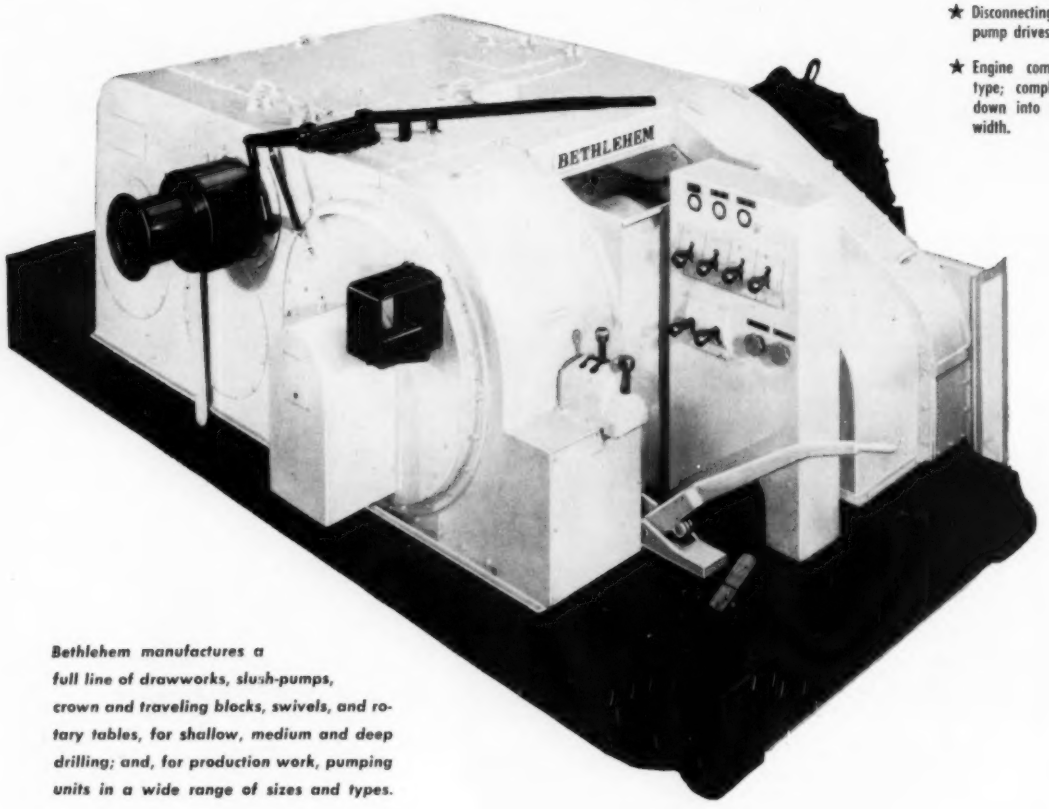
Look over the list of the M-58's star features. Consider what they mean in terms of overall economy. Then write us for more detailed information; it will be furnished promptly.

Bethlehem Steel Export Corporation
25 Broadway, New York 4, N. Y., U. S. A.
Cable Address: "BETHLEHEM, NEWYORK"

BETHLEHEM STEEL

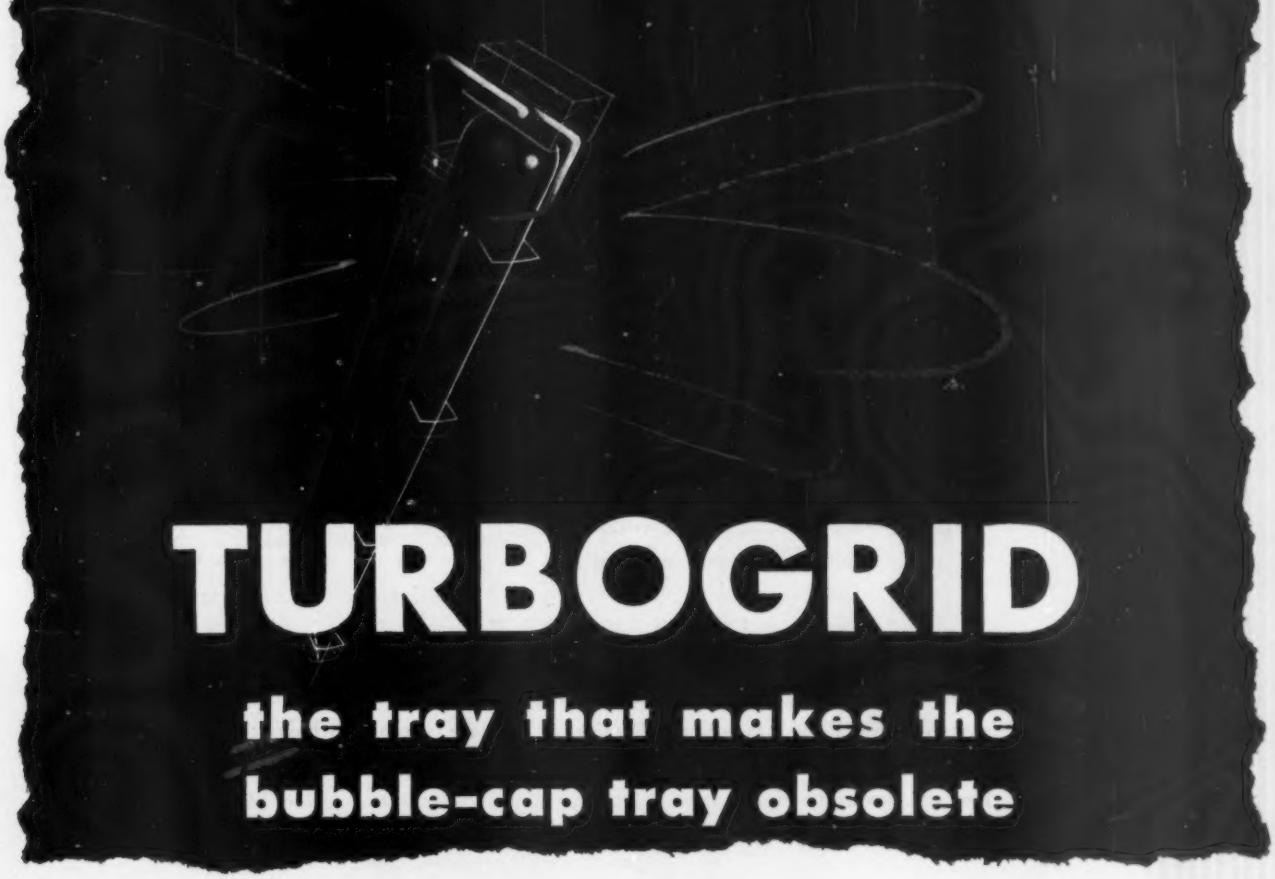
Advanced design . . . advanced engineering . . . make possible things like these in the M-58:

- ★ Two- or three-engine drive with single or double pump drive.
- ★ Mechanical drive system that can be modified for fluid drive.
- ★ Extra-large, extra-powerful brakes cooled by enclosed circulating water system.
- ★ Unitized construction with drawworks, engines, engine compound, and pump drive combined on one common skid.
- ★ Engine compound and drawworks transmission clutches of disengaging spline type; master and high and low speed drum-drive clutches of extra-high-capacity air friction type.
- ★ Disconnecting Airflex clutch-controlled pump drives.
- ★ Engine compound of sectionalized type; complete rig can be broken down into loads of required road width.



Bethlehem manufactures a full line of drawworks, slush-pumps, crown and traveling blocks, swivels, and rotary tables, for shallow, medium and deep drilling; and, for production work, pumping units in a wide range of sizes and types.

NEW DISTILLATION TRAY



TURBOGRID

the tray that makes the bubble-cap tray obsolete

HIGHER THROUGHPUT is assured when using Turbogrid trays, because they have much higher capacity per square foot of column cross-section at equal separating efficiency and much lower pressure-drop.

The simple, rugged design of this tray assures both **low fabrication and installation costs,** and low costs of maintenance. Also *stainless steel* can be used at *no extra* cost since the tray can be stamped out of sheet metal.

Replacing your old trays with Turbogrid trays may even double the capacity of existing columns without loss in separating efficiency... and at a cost which you will find attractive.

• • •

Your inquiries are invited. Turbogrid trays are available through selected contractors under license from Shell Development Company.

SHELL DEVELOPMENT COMPANY

50 WEST 50TH STREET • NEW YORK 20, N. Y.

SHELL

Straight-Line Flow... the economical path from fresh feed to product...

Orthoflow, the new streamlined Fluid catalytic cracker by Kellogg, brings new flexibility and economy to petroleum processing.

In the **Orthoflow** single-vessel units, transmission lines for both catalyst-oil mixture and spent catalyst are fewer, shorter and straight . . . slide-valves and expansion joints are eliminated . . . the catalyst transmission system completely streamlined. Erosion is minimized, maintenance brought to a new low and flexibility of operation retained.

Orthoflow can handle practically any feedstock, from kerosene to the heaviest gas oils. High-boiling stocks are charged as liquids and vaporized by regenerated catalyst with minimum use of preheat facilities.

Orthoflow also permits wide latitude in conversion, recycle, and feed rates.

In this simplified Fluid cracker design, Kellogg engineers have achieved significant savings in original investment. With both reactor and regenerator incorporated into a single vessel, **Orthoflow** saves steelwork, saves on foundations, saves piping . . . and saves thousands of manhours too.

PROGRESS REPORT
ORTHOFLOW CATALYTIC CRACKERS

UNITS OPERATING:

In Western Canada—	2,500 BPD Unit
In Mid-Continent U. S.—	8,300 BPD Unit
In Eastern Canada—	8,300 BPD Unit

UNITS UNDER CONSTRUCTION:

On the Atlantic Seaboard—	28,000 BPD Unit
In Mid-Western U. S.—	17,000 BPD Unit
On the Gulf Coast—	26,000 BPD Unit

Kellogg Orthoflow

COMPARATIVE ELEVATIONS · FLUID CATALYTIC CRACKERS · EQUAL CAPACITY

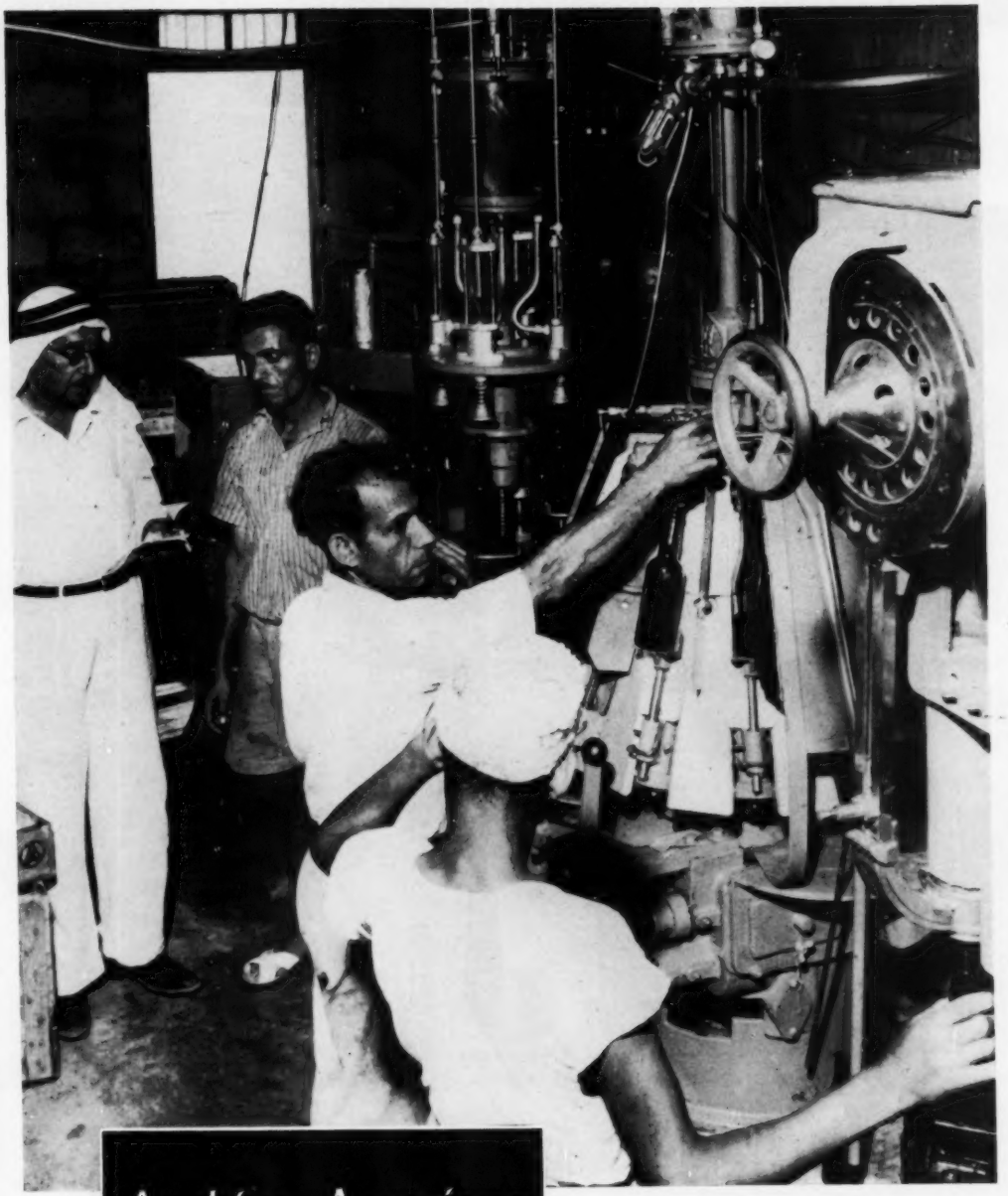
SIMPLICITY, the outstanding characteristic of **Orthoflow** and the ultimate in any field of design, is the logical outcome of Kellogg experience in Fluid catalytic cracking . . . which dates from the inception of the process and includes the engineering of 70 percent of the world's total fluid capacity. Details of this important new development in Fluid cracking are presented in Kelloggram No. 1—1952 Series "From Baton Rouge to Orthoflow". If you haven't received it, we'll be glad to send a copy on request.

THE M. W. KELLOGG COMPANY

(A Subsidiary of Pullman Incorporated)

NEW YORK JERSEY CITY LOS ANGELES TULSA HOUSTON TORONTO LONDON PARIS

KELLOGG *.....for fifty one years an integral part of petroleum refining progress!*



Arabian American Oil Company

DHAHRAN NEW YORK

A new industry comes to Saudi Arabia as Mohammed al Mana opens his Al Khobar bottling plant. Located in eastern Saudi Arabia, the semi-automatic equipment turns out 8,000 bottles of soft drinks each day.

Modern miracle in the desert

Controlling the flow of oil through 1068 miles of pipe line with minimum manpower is the job Westinghouse engineers were asked to tackle on the gigantic trans-Arabian oil project. Their answer is an ingenious Westinghouse electrical control system which keeps 330,000 barrels of petroleum a day flowing smoothly from oil fields near the Persian Gulf to storage tanks on the Mediterranean.

Five Westinghouse control stations along the line regulate the oil flow. One man at a master control board in each station directs the station operations through remote control . . . adding or siphoning off oil to increase or relieve pressure on the line. Protective devices automatically sound alarms or shut down units if something goes wrong. This modern electrical system replaces expensive and less efficient manual control methods which required large crews of men.

In addition, steam turbines for pumping . . . pipe-welding equipment . . . cathodic protection of pipelines . . . motor control centers for pipeline pumping service—provided by Westinghouse—helped to make possible this modern miracle in the desert. Such vital projects demonstrate the ability of Westinghouse to serve world industry.

Westinghouse leadership and experience in designing electrically controlled oil pipelines is on tap for similar projects anywhere—no matter how large or complex.

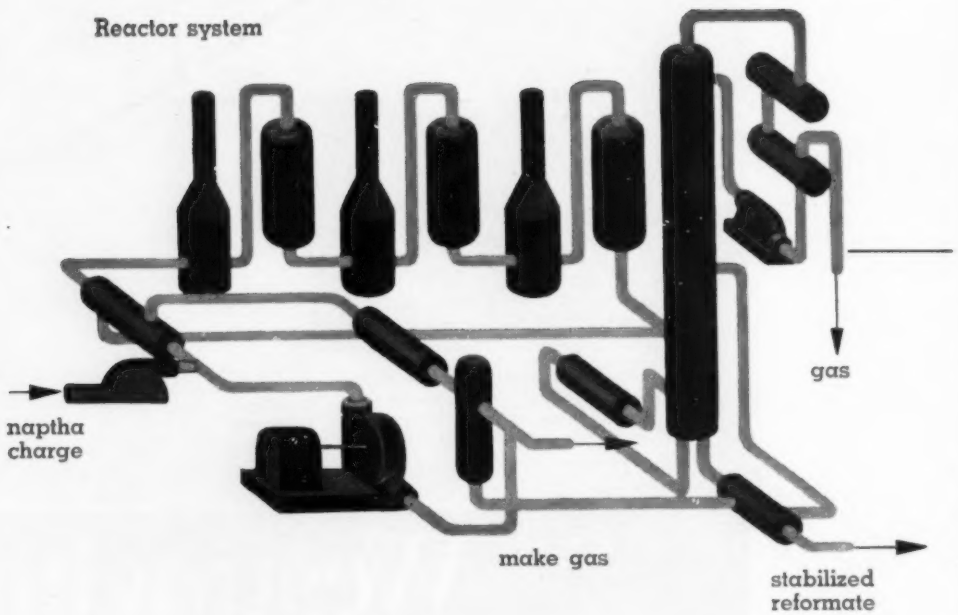
YOU CAN BE *SURE* . . . IF IT'S

Westinghouse

WESTINGHOUSE ELECTRIC INTERNATIONAL COMPANY

40 Wall Street, New York 5, U. S. A.

the Atlantic catalytic reforming process



it's the catalyst that counts

Since catalytic reforming was first utilized, numerous processes have been introduced to increase its benefits. None of these completely satisfied our requirements. So we looked for the answer in the catalyst itself.

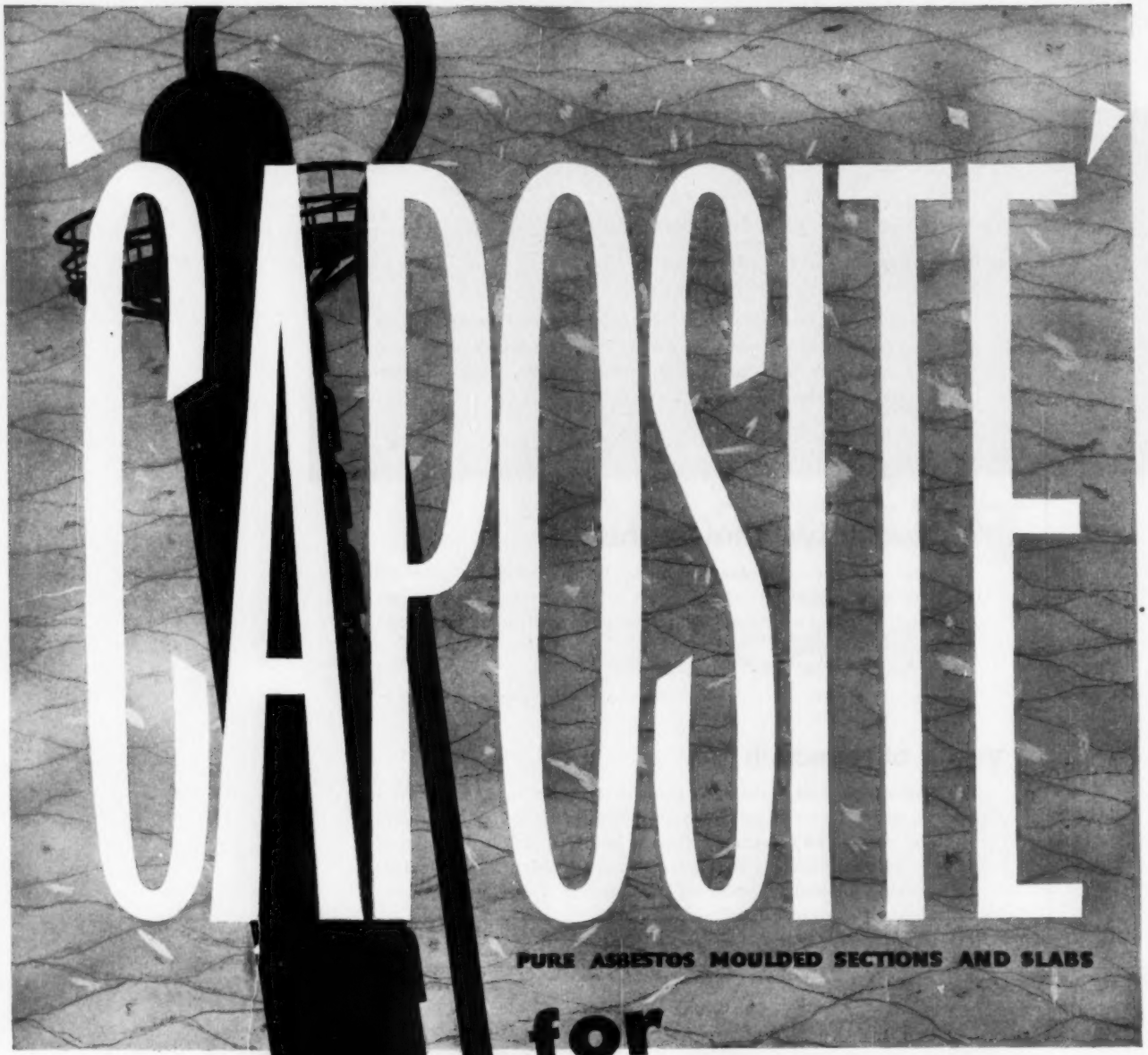
years of research

Years of continuous laboratory study were devoted to the problem . . . in a search for a new catalyst with superior qualities. This extensive research paid off in a completely new catalyst which is the heart of the Atlantic Catalytic Reforming Process. This catalyst combines improved selectivity, greater stability, excellent resistance to poisoning, and ease of regeneration.

now in commercial operation

This process is now in commercial operation. It is giving the results expected. Our engineers are ready to give you the whole story. Call or write The Atlantic Refining Company, Research and Development Dept., P. O. Box 8138, Philadelphia 1, Pa. (Telephone, Howard 5-2345.)

ATLANTIC



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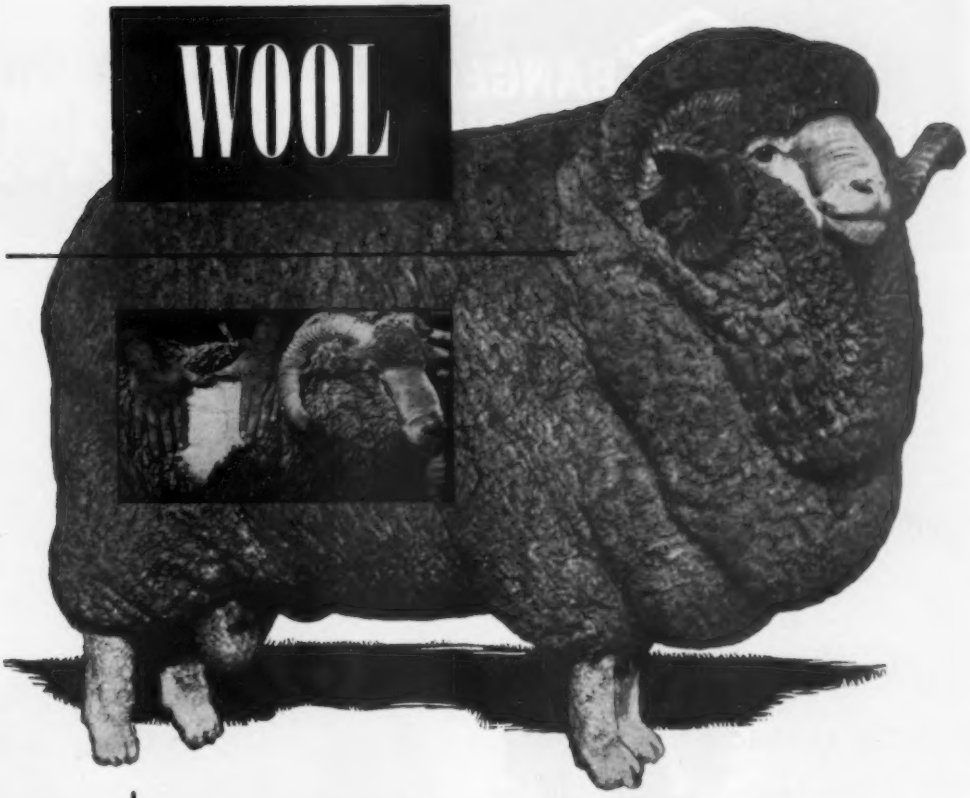
WOOL



wealth of the Commonwealth

Throughout the world
WOOL means warmth...
protection and
comfort for
man, woman, child.

And, throughout the world,
AUSTRALIAN WOOL
means **fine** wool...
soft, fleecy, **quality** wool.

Australia's
112-million sheep
today provide
1 out of every 4 pounds
of the world's supply...
more than half
of all the top-quality
Merino wool.

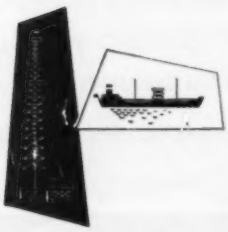
Wool is **one-third**
of Australia's
total export trade...
accounts for **one-tenth**
of the national income.

Another mighty important
commodity
to Australians is
OIL...

The petroleum products
which have aided
industrial expansion...
which give power,
light, warmth...
which fuel and lubricate
all manner of
modern transport.

More than a **billion**
imperial gallons
of oil products
each year
are the **life-blood**
in the arteries of
the Australian Commonwealth...
are helping to build
a stronger nation...
a better way of life
for the Australian people.

In Australia, as elsewhere
in the Eastern Hemisphere,
people know
they can depend on
the Stanvac organization
to supply this vital oil.



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A name that stands for "Progress" in the East

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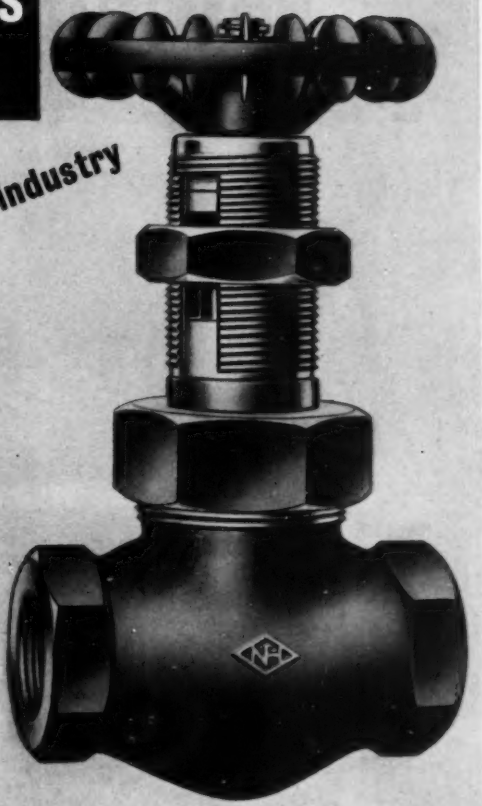
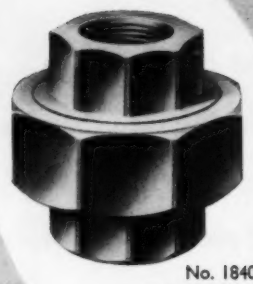
THE NH RANGE OF FORGED STEEL VALVES AND FITTINGS

covers every specific need of the oil industry



No. 1636
FORGED STEEL GATE VALVE



No. 1840
FORGED STEEL
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FORGED
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These Fittings represent a selection from our range of specialised productions for the Oil Industry.

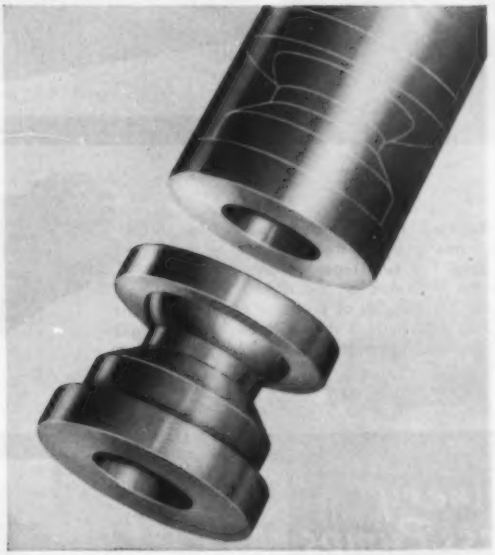
Fully descriptive literature available on request.

Newman, Hender & Co. Ltd

WOODCHESTER NH GLOS. ENGLAND.

Two ways hollow-part makers can save steel with TIMKEN® seamless steel tubing

1. DRILLING ELIMINATED!



2. MOST ECONOMICAL SIZE!

YOU save two ways when you use Timken® seamless steel tubing instead of bar stock for hollow cylindrical parts.

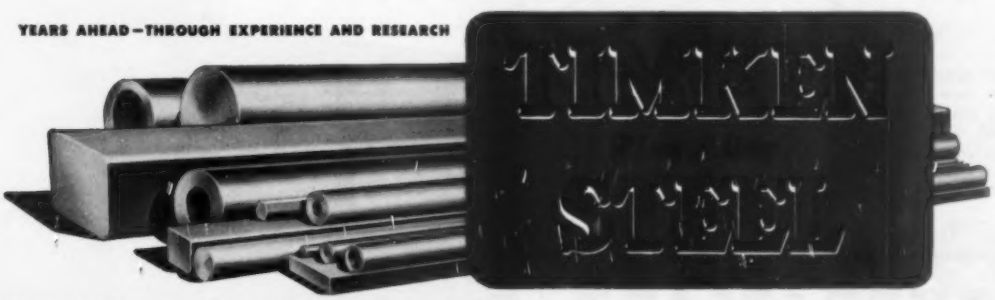
First, the center hole is already there! Drilling is eliminated, finish boring is often your first production step. You get more parts per ton of steel because there's less steel to machine away.

Second, the Timken Company offers you a tube engineering service which recommends the most economical tube size for your job—guaranteed to clean up to your finished dimensions.

You make your machine tools more productive by using Timken seamless tubing. Since you don't have to drill the center hole, screw machine stations can be released for other operations. You get added machine capacity without additional machines.

You get a better quality product, too. The piercing operation by which Timken tubing is made is basically a forging operation. It gives the tubing a uniform spiral grain flow and a refined grain structure that brings out the best in the quality of the metal. And the Timken Company's rigid control makes sure this quality is uniform from tube to tube and heat to heat. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

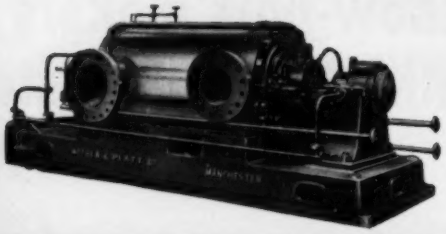
YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

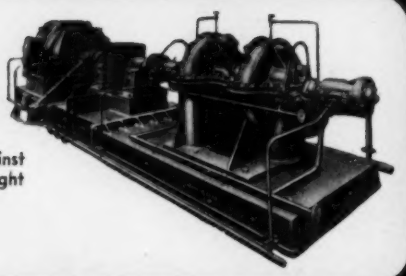
Centrifugal Pumps
& FLAMEPROOF MOTORS

Main Pipeline Pumps....



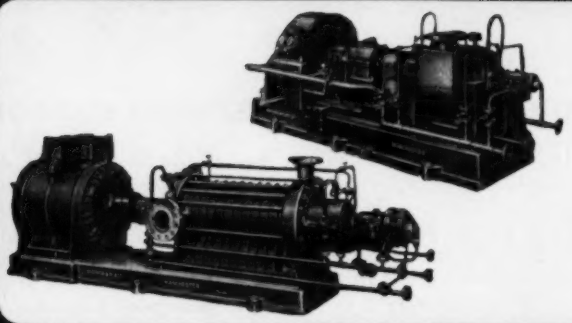
Mather & Platt multi-stage 'Plurovane' pumps were amongst the earliest centrifugal pumps installed for main line work. The pump shown on the left is a typical modern 'Plurovane' designed for a throughput of 50,000 bbls/day of crude oil against a pressure of 750 p.s.i. when running at 1500 r.p.m.

Transfer and Loading Pumps



Our standard ranges include a pump for nearly every transfer or loading duty. The two-stage "Medivane" pump illustrated on the right can handle 700 tons/hr. of crude or products against heads up to 500 ft. It is driven through a gas tight wallbox by a 550 h.p. Mather & Platt Motor.

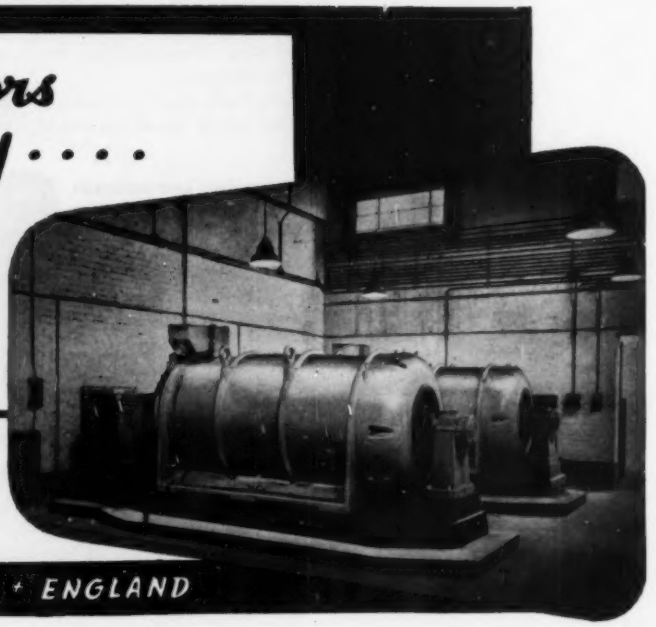
Refinery Process Pumps



Our long refinery experience at home and abroad enables us to supply pumps for the most arduous refinery duties. The illustration shows typical units:—a steam turbine driven pump handling oil at 500 degs. F. and a motor driven "Plurovane" pump dealing with light volatile hydrocarbons.

Flameproof Motors on Pipeline Duty....

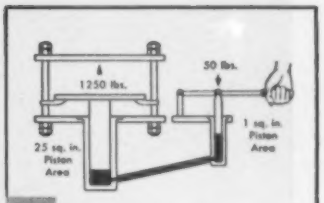
Mather & Platt electrically-driven centrifugal pumps on an oil pipe line. The motors here illustrated are of the totally enclosed flameproof type, and are of 1,000 h.p. capacity, fed from a 3 phase 50 cycle 6000/6600 volt supply. They are squirrel cage direct-on started machines with a starting current of four times full load value.



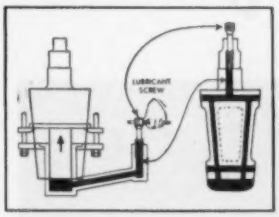
MATHER & PLATT
LIMITED
PARK WORKS · MANCHESTER, 10 · ENGLAND

Here's Why AUDCO-NORDSTROM Valves Close So Tightly, Yet Operate So Easily

1 Audco-Nordstrom valves use the basic scientific principle known as Pascal's law, which says that "pressure applied to a confined fluid is transmitted uniformly to all areas of the confining surfaces."



2 Here's an example showing how 50 pounds pressure on 1 square inch is sufficient to lift 1250 pounds when transmitted to a piston of 25 square inches.



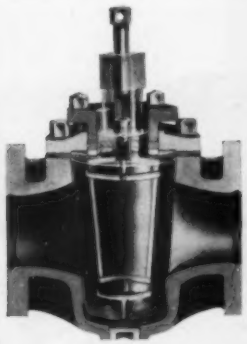
3 In Audco-Nordstrom valves, the lubricant screw applies the pressure to force lubricant through the grooves of the plug and give a powerful jacking action to lift the plug off the seat and keep the valve easy to turn at all times.

4 The grooves in the plug and body also distribute a film of lubricant across the seating surface, further sealing the valve ports against leakage, even in services where the line is carrying hard-to-hold fluids, vapors and gases.

5 A turn of the lubricant screw is all that is needed to renew the seat seal and to free the plug for easy operation.

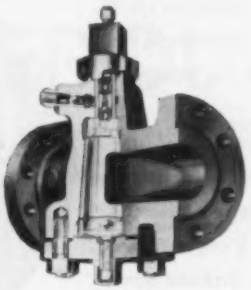
6 It takes only a quarter-turn of the plug of an Audco-Nordstrom valve to change it from fully open position to completely closed—one-tenth the time it takes to operate many valves.

7



There is a size and type of Audco-Nordstrom valves for nearly every service. Here's one with flanged ends and bolted gland. Screwed end or screwed gland patterns are also available.

8



This is the Hypreseal type of Audco-Nordstrom valve for higher pressure services. Audco-Nordstrom valves are also built with gear or power operation. Available in rectangular or full round opening. There are proper lubricants for almost every service, too.

Consult your representative

AUDLEY ENGINEERING COMPANY, LTD.
Newport Shropshire, England

Overseas Agents located in South Africa, Australia, India, Trinidad, British West Africa, Finland, Norway, Sweden, France, Belgium, Switzerland, Italy, Roumania, Spain and Portugal.

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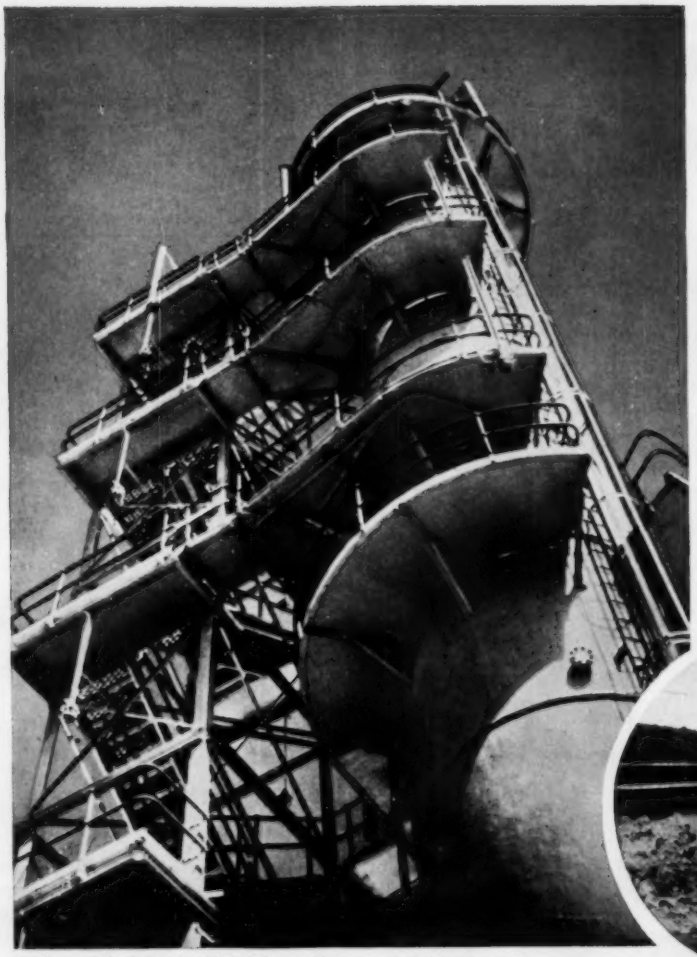
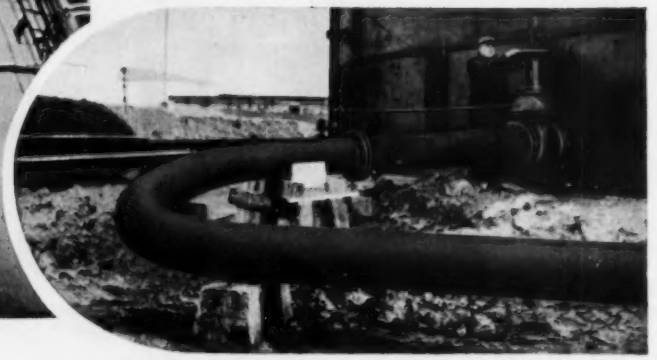
LUBRICANT SEALED VALVES



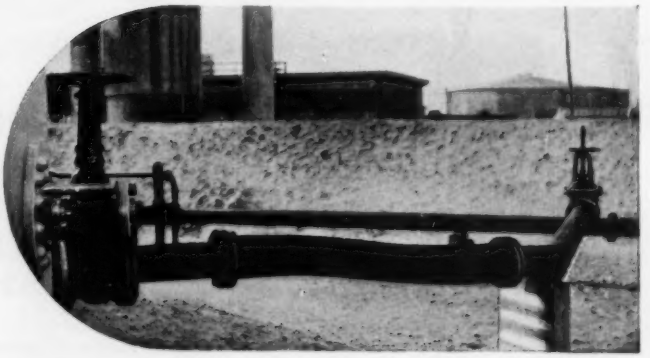
A column of the Reforming Unit at Cardon Refinery (a Shell Photograph)

* ***DUNLOP EQUIPMENT is installed at oilfields and refineries throughout the world.***

Service comes first—



Dunlop Oil Suction and Discharge Hose bridging the gap between pipe line and storage tank. This type incorporates high-quality, hard-wearing, oil resistant synthetic rubber compounds, and is suitable for the severest conditions



In the application of rubber to oil production, Dunlop have long, world-wide experience and this accumulation of practical knowledge is available to you through the Dunlop Technical Service even *before* you specify. You can obtain the skilled advice of this bureau of specialists on every aspect of equipment selection, from the first moment you consider new or replacement materials.

The wide range of Dunlop products developed for the oil industry is listed at the foot of this announcement. If you have a problem affecting this type of equipment, please contact your nearest Dunlop representative or distributor who will provide every assistance. Or, if you prefer, send your enquiry to Dunlop's Manchester address below. Technical Service advice is freely and gladly given, and no obligation is incurred by you

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A WORLD WIDE SERVICE TO THE OIL INDUSTRY

OIL SUCTION & DISCHARGE HOSE, SLUSH PUMP HOSE.
INDUSTRIAL HOSES for a wide range of uses in the Oil Industry such as welding, and pneumatic tool use.
V-BELTS to A.P.I. or B.S.I. Specifications.
FLAT TRANSMISSION BELTING. ***CEMENTING PLUGS.***
VALVE INSERTS. ***PACK-OFF RUBBERS.***
SWAB RUBBERS. ***PISTON RINGS.***

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Cables: Rubber, Manchester *Depots and Distributors throughout the World*
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Two Place Astra-Coupe designed by Richard Arbib for the VEEDOL *"Dream Car" Salon.*

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For All Cars... Old and New...

VEEDOL

The World's Most Famous Motor Oil

VEEDOL, product of the most modern and scientific developments in the petroleum field, is specifically designed to more than keep abreast of modern-day motor demands. VEEDOL is expertly refined to bring you great performance from the famous "Film of Protection" that keeps motors *safer, cleaner, smoother-running!*

TIDE WATER ASSOCIATED OIL COMPANY

FROM CLEARED SITE

To

ON STREAM

In

11 MONTHS

because of

UNDIVIDED RESPONSIBILITY

The cleared site with hard-surface roads installed for construction efficiency.

$25,000,000 plant with 30,000 B. P. D. quadruple reactor Houdriflow catalytic cracking unit, gas recovery and gasoline stabilization plant, polymerization plant, crude distillation unit and vacuum flash unit, boiler plant, water supply and cooler, product tankage, storage, electric sub-station and offices.

Undivided responsibility made it possible to coordinate process design, engineering, purchasing, expediting and construction—so that this outstanding performance was possible.

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Research & Development	Economic Studies	Procurement
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THIS MONTH'S COVER

Forty major river crossings are made by the Transcontinental Gas Pipe Line Corporation's system in its 2,000-mile line stretching from the Rio Grande Valley in Texas to New York City. Four crossings were made by bridge similar to the Brazos River crossing pictured here. The 30-inch line has a capacity of 500 million cubic feet of gas daily. Color plates are reproduced through the courtesy of *Steelways* magazine which is published bimonthly by the American Iron and Steel Institute.

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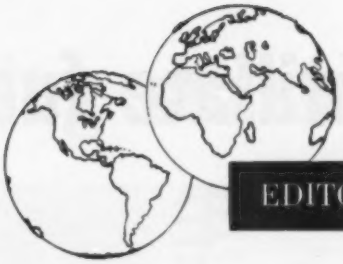


EDITORIAL

CARTEL CAMPAIGN A STEP TOWARD INDUSTRY SUBJECTION

PERUSAL of the staff report to the Federal Trade Commission on "The International Oil Cartel" made public on the eve of the federal government's widely heralded grand jury investigation in Washington and a survey of the inflammatory statements issued in advance of its publication, explain the widely held opinion that the procedure is political rather than juridical. The whole preliminary build-up, with its half-revealed charges and hints of sensational disclosures to come has been accurately characterized as a sort of strip tease publicity calculated to whet the public appetite for more startling revelations to come.

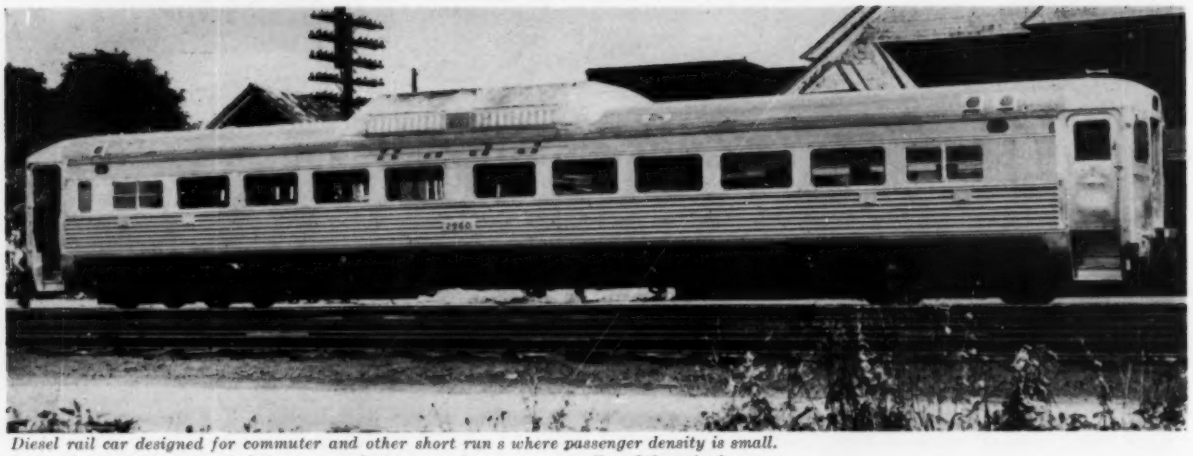
After the great expectations that had been raised by the advance publicity, the actual publication of the report came as something of an anti-climax. Those who had the fortitude to wade through its nearly 400 pages realized that, for the most part, it was a threshing of old straw that had been beaten over to the point where little but chaff remained. Nevertheless, it contains possibilities of serious harm, not only to the oil companies attacked, but also to the interests of the country and to the standing and influence of its representatives abroad. Coming at a time of cunningly inspired efforts to rouse hatred of all things American, and especially to discredit oil companies and to stir up violence, not only in the Near East but in other oil regions, it possesses possibilities of imperiling the security of the entire free world. No matter how ill-founded the statements and insinuations, they could be used with dire effect by the minions of autocracy who could present them as official utterances of a capitalist government. As pointed out by Chairman Rodgers of The Texas Company in his letter to Senator Sparkman, the charges contained in the report and the publicity attending their publication provide the Kremlin with devastating ammunition for use against the oil companies in the countries in which they operate. That full use will be made of this material may be accepted as a certainty in view of the well-known propaganda practices of the communist forces. In view of existing conditions, it is scarcely edifying to see a group of great and honorable companies used as whipping boys in an election campaign.

The statement that one of the main purposes of the attack being made on international oil companies is to protect the interests of small independent producers is received with considerable skepticism by the independent operators themselves. Their experience with governmental intervention has been that whenever the federal administration displays a special interest in oil, it is with some extension of governmental control over the management of the industry in view. Consequently, they fear that the present drive against the international companies, if successful, may be only the forerunner of a renewed attempt to expand its authority over the industry within the United States. In numerous cases, they have not hesitated to express this apprehension.

While the report to the Federal Trade Commission deals mainly with conditions in the international field, it contains passages asserting that price maintenance plays a part in industry operations within the United States and leads to the logical deduction that success in the drive against the internationals might be followed by an effort to upset some of the presently established practices under state supervision. For example, in commenting upon proposals discussed in the 1920's at the time of a projected export organization under the terms of the Webb-Pomerene act, the report observes: "There is a striking similarity between this recommendation [to adopt 1929 as a base from which to estimate probable requirements] and the 'as is' quota provisions of the Achnacarry agreement." Later on, in discussing the oil conservation movement as applied by producing states, it is remarked that market stabilization as well as technological considerations is a factor in the regulations applied. From a perusal of the report it is fair to conclude that the activities of the Interstate Compact Commission, the advance estimates of probable demand issued by the Bureau of Mines, and methods of state regulation such as those employed in Texas are all regarded with disfavor.

Members of the oil industry are well aware that certain influential forces in Washington have long encouraged a creeping paralysis of socialism that would ultimately put the federal government in full control of industry, and that eternal vigilance is needed to stay the stifling domination of centralized bureaucratic power over oil. That the present drive against an important segment of the petroleum industry is a step toward reducing it to further subjection is a justifiable assumption.

Distillate fuel supplies appear



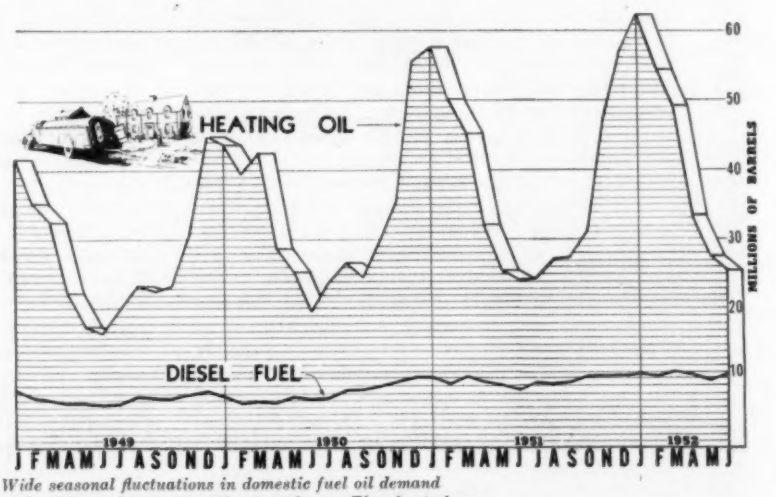
Diesel rail car designed for commuter and other short run s where passenger density is small. One such 90-passenger car is being operated at a cost of 50 cents per mile. Other single or two-car trains of this type are designed for mail and express. Photo courtesy DIESEL PROGRESS *magazine.*

THIS IS THE SEASON of the year when those who enjoy worrying are at their best. Winter is coming on apace. The oil burner people have been busy installing some 700,000 thirsty new burners in the past 12 months. The railroads have put into service some 3,250 even thirstier new diesel-electric traction units. The military is continuing to fly more jets. Automotive and other diesel installations continue to expand. Add it all up and the worriers of the shortage type can have a field day. Leaders in this field are the economists of the Petroleum Administration for Defense in Washington who are urging refiners to increase their yields of middle distillates and to keep crude runs at a high level.

Of course not every worrier is of this type. There are a good many who are ready to worry about an oversupply of distillate and diesel fuel. Recently the weekly reports of the American Petroleum Institute have shown a remarkable build-up of middle distillates in primary storage. Refinery and terminal stocks have been rising at three to five million barrels weekly. When the refinery strike was settled a few months ago the stock of distillates was some eight million barrels below 1951. Now the numbers are reversed. As this is written, stocks are well over 100 million barrels and may pass last year's pre-season peak of 110 million barrels by October, a month ahead of the date when stocks usually are at their highest level.

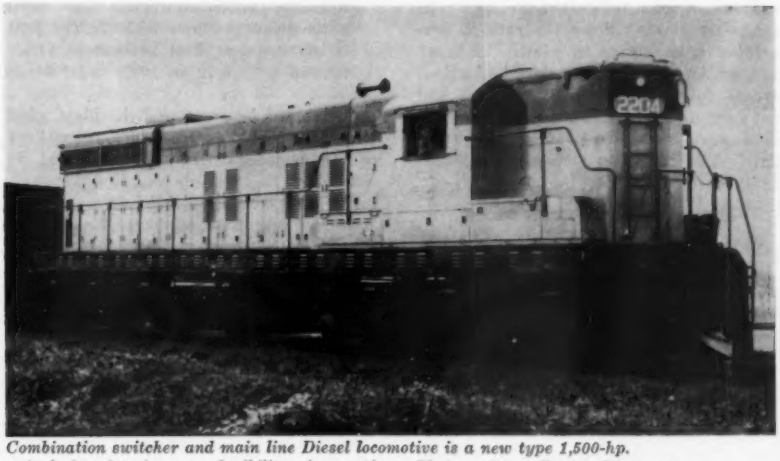
No matter what his view may be of the sufficiency of middle distillate supplies for the current winter, nearly every refiner is entitled to worry about the motor fuel supply and storage situation which the growing demand for middle distillates tends to create. The imbalance in demand as compared with normal refinery yields grows more acute each year and causes more and more refiners to install coking facilities to improve flexibility. This year the lag in motor fuel demand has created difficulties. Gasoline stocks were burdensome when the oil strike came on. The extended refinery shutdown alleviated the situation, but the current urge to keep ahead of distillate fuel demand is re-creating the same condition.

The oil company view of the distillate fuel supply situation for the 1952-53 season is perhaps best indicated by the current relaxation of restrictions in supply contracts with distributors. At midyear, refiners were advising many East Coast furnace oil dealers that they would not agree to supply more oil than in the 1951-52 season. Some were a bit more generous, but the tendency was to be cautious. In recent weeks the oil com-


HEATING OIL
DIESEL FUEL
60
50
40
30
20
10
MILLIONS OF BARRELS
1949
1950
1951
1952
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J

Wide seasonal fluctuations in domestic fuel oil demand make this market unattractive to refiners. The chart shows refinery shipments of furnace oil as compared with diesel fuel.

adequate for coming season



Combination switcher and main line Diesel locomotive is a new type 1,500-hp. unit designed to increase flexibility of operation. Photo courtesy DIESEL PROGRESS.

panies generally have been telling their distributors that an increase of 10 percent in supplies will be available. In the middle west where ocean transportation is not a factor, the situation is even easier.

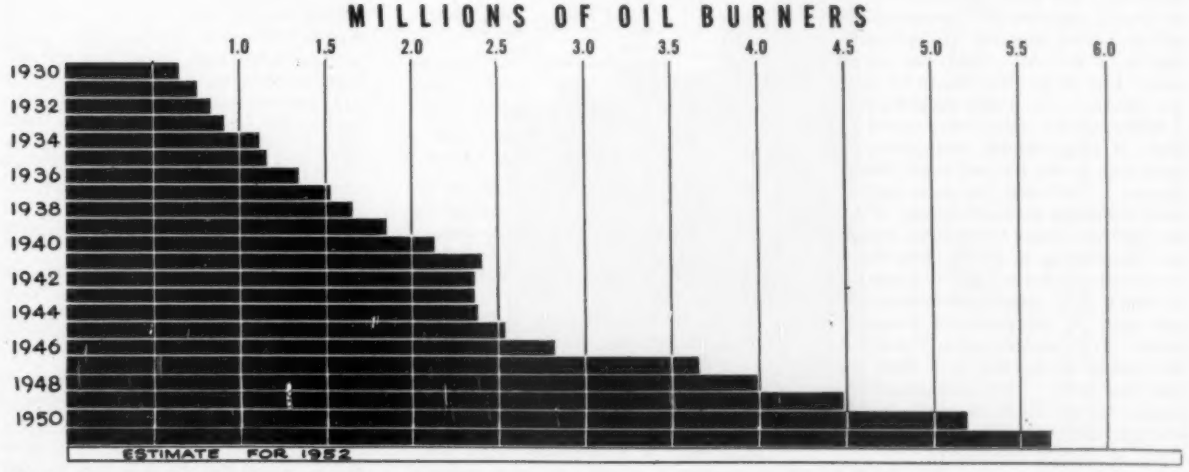
Oil company economists are less sure of their ground in calculating probable future demand for heating oils than for other products. The weather man is to blame for this. He doesn't say very far in advance what is to be expected in the way of temperatures. The economists have been basing their calculations, therefore, on long-term averages which make up "normal" temperatures.

For the past four years temperatures in the United States generally have been somewhat below "normal." Despite this fact, nobody has had to go cold for lack of fuel, even in the New England and other Atlantic Coast areas where shipping was overtaxed.

Having experienced four cold winters, the men who deal in numbers believe that the law of averages probably will begin operating in the 1952-53 season and provide a winter which is warmer than normal. If this should be true the industry may be over-preparing. Distillate may be "running out of everyone's ears" before the winter is over. On the other hand, the season, of course, could be very severe.

One difficulty in assessing the ability of the industry lies in a lack of precise knowledge about storage facilities of home owners and dealers and of the volume of oil in these tanks at any one time. Information about oil company storage facilities at terminals also is incomplete. An effort is being made to take care of these deficiencies now. The Census Bureau is making an effort to find out something about dealer storage and a committee of the oil industry is preparing a report on other storage which will be presented to the National Petroleum Council before long, perhaps by the time this is published.

Using a "sampling" method, the editors of *Fueloil and Oil Heat* magazine have been supplying data on consumer and dealer storage in past years. It is calculated that consumers have an average of 10 barrels of fuel oil storage capacity installed and since there were six million units in American homes on August 1, the storage capacity on this basis is a not inconsiderable 60 million barrels. *Fueloil and Oil Heat* magazine studies also show that home storage on August 1 was about 60 percent full. This means that the oil in consumers' hands at mid-sum-



By the end of 1952 it is estimated that there will be about 6,335,000 domestic oil burners in operation in the United States.

mer was about 36 million barrels. A year ago the figure was calculated at 35 million barrels.

The same publication estimated last year that dealer storage capacity was 25 million barrels. As mentioned above, this matter is being made the subject of a study by a special API committee. It is reported that the findings will show distributor storage capacity to equal about 11 percent of annual sales. Total tankage has risen 86 percent in the past five years while sales have risen 56 percent. Most distributors think that oil companies should promote tankage building by offering distributors a summer fill-up price around a half cent below the winter level. Refiners are not too much interested in this because they feel that fuel prices are too low now.

The fuel price situation on the eastern seaboard has been improved somewhat by an OPS grant of an increase of 0.8 cent per gallon, divided 0.15 cent to the dealer who operates his own bulk plant and 0.65 cent to the refiner. Primary suppliers who do not own and operate their own tankers still are not entirely satisfied. Those with tanker fleets probably are better able to absorb rising marine costs.

Oil burner manufacturers and dealers have been enjoying a satisfactory year thus far. In the first seven months burner installations totaled 308,601 compared with 279,189 in the same period last year, an increase of 11 percent. It now is estimated that sales this year will be around 700,000, compared with 692,202 in 1951. This will be the industry's third best year. About 12 percent of units sold are needed to replace worn out units so that the net increase anticipated this year will be about 616,000. Total in place at the end of the year may be about 6,335,000 compared with 5,719,367 at the end of 1951.

Average annual consumption of fuel per burner in 1951 was 39 barrels. Assuming that the coming winter is about like last year, the total home heating load on the oil industry will approximate 247 million barrels compared with 222 million barrels in 1951-52. This was approximately half of the oil produced by American refiners in the middle distillate range.

Railroads have continued to add to their fleets of diesel-electric locomotives at a rapid rate during the past year. Between August 1, 1951 and the same date this year, American railroads placed in service 2,470 new diesel locomotives, bringing the total fleet up to 13,778. The increase in traction units was 3,257 to a new total of 19,488 units. Most freight locomotives and many of the passenger locomotives consist of two or more units. The average for freight locomotives is a little more than two units. Average horsepower of locomotives on U. S. railroads is 2,500, a higher figure than the average for either steam or electric locomotives.

Diesel fuel consumption of railroad locomotives is about 5,400 barrels per year, indicating that the railroads will require about 74 million barrels of middle distillates this year for diesel locomotive use. Deliveries of diesel fuel to U. S. railroads in 1951 totaled 58.6 million barrels compared with 47.1 million barrels in 1950, an increase of 24.4 percent. Indicated increase this year will be about 26 percent over 1951.

There is some indication that the railroads are slowing down the rate of conversion from steam to diesel. A year ago, on August 1, the carriers had placed orders for 1,588 locomotives which had not been delivered. This year unfilled orders were down to 1,186 on the same data. The drop was 34 percent. Details by types follow:

DIESEL LOCOMOTIVES ON ORDER

Type	Aug. 1, 1952	Aug. 1, 1951
Passenger	49	114
Freight	265	635
Pass. or Ft.	68	74
Switch	512	765
Total	**894**	**1,588**

In the past year the railroads added 2,470 diesel locomotives and retired 5,776 steam and 18 electric locomotives from service. Because of the much higher tractive effort per diesel locomotive, the net decrease of 3,324 railroad locomotives caused a decrease of only 4.5 percent in aggregate tractive effort of the combined fleet. The railroads were able to absorb this decline in horsepower because of the far greater percentage of active service which a diesel locomotive gives each month. As of August 1 this year, diesel locomotives had 51 percent of the power available to all railroads as compared with 40 percent a year ago. Increase in the diesel fleet's aggregate tractive effort in the 12-month period was 203.7 million footpounds, about 22 percent. Steam power decreased 30 percent.

The inventory of diesel electric locomotives of various types on August 1 this year compared with 1951 was as follows:

DIESEL LOCOMOTIVES IN USE

	Aug. 1, 1952		Aug. 1, 1951	
Type	No. Locomotives	No. Units	No. Locomotives	No. Units
Passenger	1,306	2,126	1,018	1,761
Freight	4,325	8,947	3,347	7,303
Pass. or Ft.	622	796	483	620
Switch	7,525	7,619	6,460	6,547
Total	**13,778**	**19,488**	**11,308**	**16,231**

In 1951 the railroads took almost exactly half of the diesel fuel shipped by U. S. refineries. Total indicated demand for diesel fuel was 116 million barrels of which the railroads took 58.6 million barrels.

In the first five months of this year, railroads took nearly 53 percent of diesel fuel deliveries. The total was 27.8 million barrels to the railroads and 25 million barrels to other diesel power purposes.

The insistence of demand and the encouragement of a somewhat better price has caused U. S. oil refiners to increase their cut of middle distillates in recent months. Distillate yields this year have been running about two percent higher than a year ago. In the first six months, distillate production averaged 21.08 percent of crude runs to stills. This compares with 18.49 percent in the first half of 1951 and 19.97 percent for the entire year. In 1950 distillate yield was 18.98 percent of crude.

Kerosine yield meanwhile has been slightly below previous records. The first half average was 5.44 percent of crude compared with 5.70 in 1951 and 5.64 in 1950.

Combined kerosine and distillate yield this year is running 26.52 percent of crude compared with 25.67 percent in 1951.

In any discussion of future requirements of petroleum products, the question of jet fuels comes up for consideration. In a symposium conducted at the annual meeting of the National Petroleum Association on September 11, J. Bennett Hill of Sun Oil Co. presented a forecast of probable development in demand for this type of fuel for civilian transport in the coming decade.

"The total commercial use of aviation gasoline in the U. S.," he said, "has grown from seven million barrels in the first postwar year of 1946 to 16 million barrels in 1951 and an estimated 20 million barrels in 1952. The curve shows a fairly consistent rate of climb up to 1950, but an accelerated rate of climb in the last two years. The demand for fast travel is definitely on the up. If we were to extrapolate this curve on the assumption that reciprocating engines would still power our aircraft, we might arrive at a figure of 28 million barrels in 1957, and 32 million barrels in 1962.

"The use of turbine-powered air transport by airlines in this country probably will not be of importance quantitatively in 1957. The problems of the airlines in making the shift are many. Even if they should decide to purchase already developed British planes, it is reported that the British manufacturers have enough orders to carry them through 1954. After planes are delivered, the airlines will still have the problems of setting up operating and maintenance procedures, of integrating the faster planes into the traffic pattern of slower planes, and many others. There will, of course, be British and other foreign planes fueling in this country, but even at that, an outside estimate of the amount of jet fuel might be four percent of total aviation fuel.

"For 1962 the opinions of the experts on probable jet fuel consumption vary from five percent to 20 percent of the avgas demand. Fifteen percent may be taken as a fair estimate.

"On this basis a jet fuel demand of 1.1 million barrels in 1957 and 4.8 million barrels in 1962 is in prospect. Conservative estimates of crude production in these two years are 2.6 billion barrels in 1957 and 2.8 billion barrels in 1962. The jet fuel demand would therefore be 0.04 per-

cent of crude in 1957, and 0.17 percent in 1962.

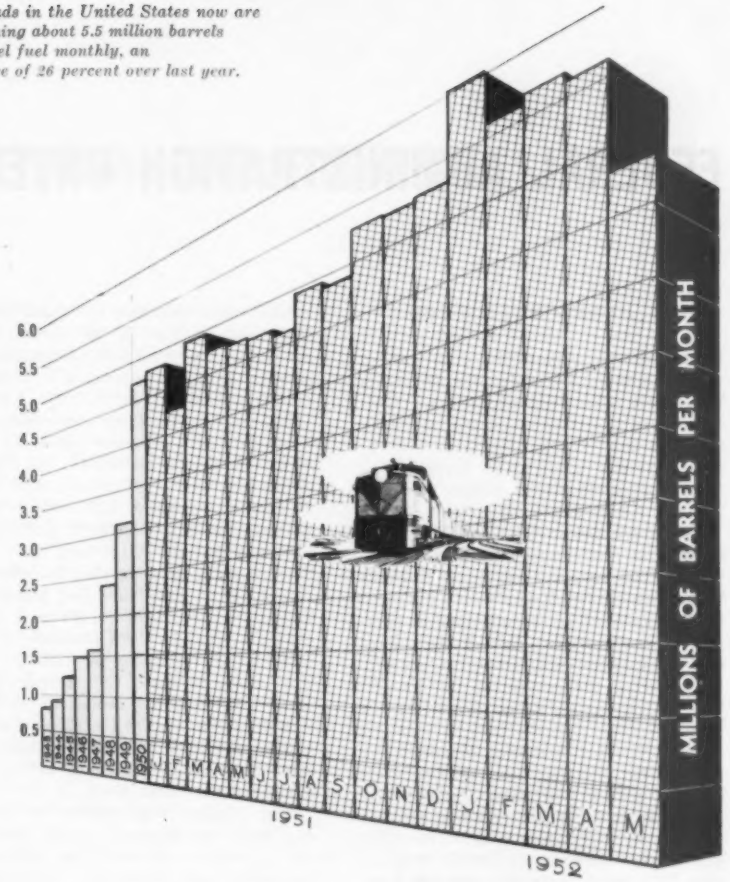
"As compared with these figures, the railroad diesel fuel consumption in 1951 was 57 million barrels. Kerosine was 131 million barrels. Motor gasoline was close to one billion barrels. We are, therefore, dealing with figures which are certainly not too large for the petroleum industry to handle, and are not anything we should be frightened about, although we should certainly take them into consideration in our future plans.

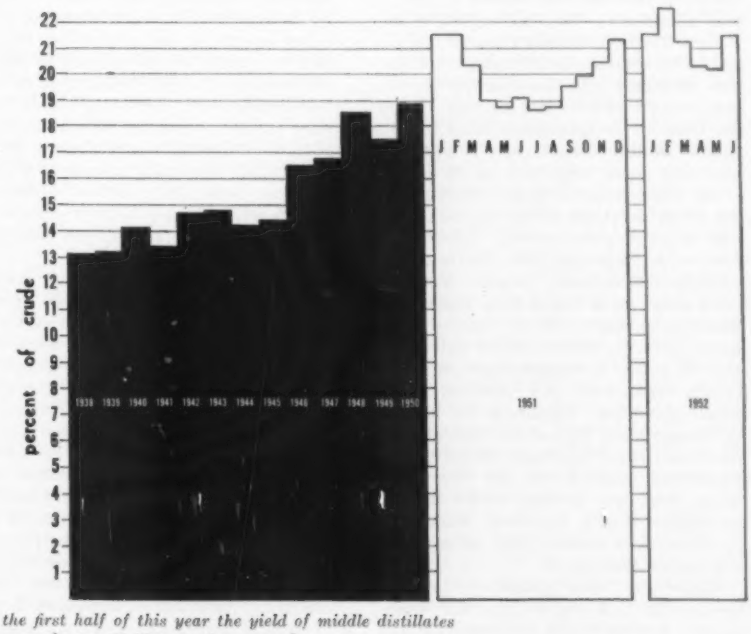
"The next obvious question is what quality fuel will be required for commercial turbine aircraft. There is practically universal agreement that it will not be the same as the military fuel, as, for example, JP-4. The extent of the safety advantage of a high flash fuel is still disputed, but probably everyone will agree that there is enough advantage to make the airlines insist on a low volatility fuel of the kerosine type. We may expect something, therefore, similar to JP-1. For stability reasons it may be a straight-run fuel, and for combustion reasons it may be limited by excluding those crude sources which would give a very high aromatic content. On the other hand, there would seem to be no reason why commercial fuel should have the very low freezing point of —76°F. required for military fuels. This specification might very well come up to —40°. The present British commercial specification is probably not very far from what will be adopted.

"How fast the utilization of turbine engines by the airlines will grow will depend on the cost to them of the fuel. The cost probably will be of the order of kerosine or slightly above. It probably will find its level about one cent to 1.5 cents under regular grade motor gasoline. It should be materially below any of the present grades of aviation gasoline. As compared with current Gulf Coast prices of about 10 cents for kerosine, 11.5 cents for regular grade motor gasoline, and 16.5 cents for Grade 100/130 aviation gasoline, the corresponding figure for jet fuel for commercial transports should be between 10 and 12 cents per gallon at the current prices, and probably closer to 10 cents.

Each year the industry is better able to meet peak demands for furnace oils and to supply the rapidly growing demand for diesel fuel. This is being accomplished by more coking and by substantial increases in storage. This situation could be wrecked completely by a major war which would place a tremendous demand on the industry for jet fuels. Judging from past records, however, the weather man probably will not be able to do much to disrupt an adequate supply of middle distillates for power and heating purposes. If there is any worrying to be done, it may be that it should be done by those who must sell the gasoline which must be made as an adjunct of increased distillate production.

Railroads in the United States now are consuming about 5.5 million barrels of diesel fuel monthly, an increase of 26 percent over last year.





In the first half of this year the yield of middle distillates from crude was 21.25 percent compared with 19.97 percent in 1951 and 18.98 percent in 1950.

FEDERAL ADMINISTRATION UNVEILS THREE-PRONGED

BY JOSEPH HUTTLINGER

THE FEDERAL administration's war on international oil companies is getting under way after long preparation. Governmental forces are opening the campaign on three fronts. First, there is the well-advertised grand jury investigation by the Department of Justice directed against American, British, and Anglo-Dutch companies on the charge that they operate an international "cartel." Then there is the action of the Small Business Committee of the Senate which has been conducting hearings on oil industry operations at intervals and claims credit through its chairman, Senator Sparkman, for securing the release of the Federal Trade Commission report which is the principal basis for the cartel allegation. Thirdly, though conducted independently of the other operations, are the civil suits brought against four companies in behalf of the Mutual Security Agency for $67 million on the ground that excessive prices were charged for Middle East oil sent to Europe under the Marshall plan.

In politically-minded Washington, the timing of the combined assault is considered significant. The staff report to the Federal Trade Commission was authorized by the Commission in December 1949 and was completed in 1951 although the report as published carries no date. From the time of its submission until late in August of the current year, it was held nominally secret, reportedly on the advice of the Department of State that it might impair the relations of the United States with other friendly nations. During the fanfare of publicity that provided the build-up for Attorney General McGranery's move for a grand jury hearing in Washington, many of its charges were made known through unofficial statements and the names of the companies to be attacked, American and foreign, were widely publicized. Finally, at the request of Senator John Sparkman, chairman of the Senate Small Business Committee and Democratic nominee for the vice presidency, President Truman authorized the publication of the report on August 22 and it actually became public property at the end of that month.

Meanwhile, the Attorney General, through the U. S. District Court in Washington, sent out to 21 oil companies and to the secretary of the National Petroleum Council subpoenas commanding them to produce by Sept. 3, "all contracts and agreements" entered into or discussed between any of the companies or with sovereign governments since Jan. 1, 1928 and "all letters" sent from one company to another. The companies named in these subpoenas are: Standard Oil Co. (N. J.); Anglo-Iranian Oil Company Ltd.; Iraq Petroleum Company, Ltd.; Shell Transport & Trading Company, Ltd.; Royal Dutch Petroleum Co.; Gulf Oil Corp.; The Atlantic Refining Co.; Standard Oil Co. of Calif.; The Texas Co.; Sinclair Oil Corp.; Pan American Petroleum & Transport Co.; Standard Oil Company (Ind.); Superior Oil Company of Calif.; American Independent Oil Co.; Kuwait Petroleum Co.; Arabian-American Oil Co.; Standard Vacuum Oil Co.; Near East Development Corp.; Bahrein Petroleum Company Ltd.; California-Texas Oil Co.; and Conorado Petroleum Corp.

The physical impossibility of complying with this dragnet demand involving the production of scores of millions of documents and letters and requiring an intensive search of company files extending over a period of more than 24 years, led to requests for an extension of time. Court orders for such extension, application to quash the proceedings as illegal, and requests that the Department of Justice specify more exactly the points it desires to have covered in its requisition of potential evidence have resulted in the allowance of temporary extensions of time in some cases while further delays are considered inevitable because courts will be unable to hear cases already filed until after October 1.

In the opinion of Washington lawyers familiar with the course of past government suits directed against an entire industry or a large group of companies, months if not years will be required for trial of the case, assuming that the grand jury finds a true bill, but it is pointed out that any political advantage that the administration may glean from its accusations will accrue in the presidential campaign now under way. It is held possible that the prosecutor may count on obtaining an indictment on the strength of the Federal Trade Commission report and other written testimony and that, since the grand jury will be composed largely of federal employees, a finding may be reached before election day.

The report is described by its sponsors as merely "descriptive and factual," but its real tenor is disclosed by the assumption throughout that a "cartel" controlling production, distribution and marketing is an actuality. Most of the "descriptive" material consists of detailed accounts of agreements or proposed agreements for joint ownership or operation of international fields from the beginning of the century until after World War II and leaves the impression that these proposals are a part of present operation despite the fact that some of them never were put into effect. Others, like the much discussed "Red Line" agreement barring members of the Iraq Petroleum Company from undertaking independent operations within the company's concessionary area, were dissolved by action of its participants and none of them applied to the United States.

"Four basic international agreements" on which the report rests its claim to the present existence of a world-wide cartel are named as "the Achnacarry agreement of 1928, the memorandum for European markets of 1930, the heads of agreement for distribution of 1932, and the draft memorandum of principles of 1934." These grandiloquent titles refer to alleged agreements affecting production and distribution in the international field, all of which date back a score of years ago and none of which were ever fully effective as the report incidentally acknowledges.

In the preface to the report as issued by the Sparkman committee, the Senator states: "With reference to the alleged oil cartel, it has been the aim of this committee to learn (1) whether or not five major integrated American oil companies have joined two foreign companies in a series of international monopoly agreements; (2) whether or not the structure of international oil prices has imposed an excessive burden on the economies of friendly nations, and thus on the American public which is extending economic and military assistance to these nations; and, perhaps most important of all, (3) whether or not the dumping of foreign oil in the United States, at a net cost far below the price charged in Europe and the Middle East, is causing injury to independent American oil producers."

Further on in this introduction he observes: "Where power exists there also exists the possibility of abuse. Today the

ATTACK ON INTERNATIONAL OIL COMPANIES

power of international oil companies is so vast as to invite its abuse."

Here, rather than in the recapitulation of outdated efforts to stabilize foreign markets, in the opinion of Washington observers, is the real basis for springing the attack on the oil companies at what is considered a favorable political juncture. The international oil industry is big business, and in the political primer of the present administration, bigness connotes badness and success is a vulnerable target for attack.

Support for this theory is provided by slanting shots at the Interstate Compact, the American Petroleum Institute, and the whole cause of conservation as administered by the oil producing states. Referring to the start of the conservation movement in the 1920's, the report says: "The stated objective of proration in the United States has always been conservation, i. e., obtaining the maximum total yield of oil from each producing field. Valid technological considerations indicate that this objective is best achieved by operating each field as a unit in such a manner as to maintain the natural hydrostatic and gas pressures necessary to assure maximum total recovery. Proration for conservation alone involves only the limitation of production in each field to those allowables which will maintain those pressures, regardless of the price at which the oil can be sold.

"In actual practice, however, the definition of 'conservation' used by the oil industry has always combined this technological objective of a maximum total recovery with the market objective of regulating production in order to stabilize prices. Even before there were any state compacts, the quotas suggested by the representatives of the industry or by the advisory committee acting for the Oil Conservation Board were designed to attain the market as well as the technological objectives."

In view of repeated efforts of certain divisions of the federal government over the past dozen years or more to inject the government more and more directly into control and operation of the petroleum industry, the belief is expressed in various quarters that the current assault is the opening gun in a new campaign to extend its growing authority over the entire industry. To direct the initial attack against a few large companies, it is held, will arouse a minimum of public opposition and, if successful, will pave the way for extending the movement within the U. S. coastline.

One of the objectives of the Senate Small Business Committee, as stated by Senator Sparkman, is to determine whether the "dumping" of foreign oil in the United States is causing injury to independent American oil producers. This invitation to individual producers to support the drive against the international companies seems to have aroused little enthusiasm thus far among domestic concerns. It is pointed out as a more practical example of what may be expected under government control, that another federal bureau has consistently refused to allow an advance in crude prices to cover higher wages and material costs.

Speaking before the National Petroleum Association, an organization made up predominantly of independent companies, at its September convention in Atlantic City, President Earle M. Craig, chairman of the board of Freedom-Valvoline Oil Co., declared that the government's oil cartel charges are not a matter of cheer for small businesses, but rather a "cause for fear that a similar attack may be made upon us."

"The most recent example of federal government intrusion in the oil industry," he said, "has occurred in the past month when with great fanfare some of the larger oil companies are accused of being members of an international conspiracy to dominate world oil trade.

"It is apparently part of a shrewd propaganda technique that this attack is being made for the benefit of small business. However, we of the smaller companies of the industry are not cheered by this act of government because we recognize that an unjust attack on one company or a group of companies does not help us, but gives us cause for fear that a similar attack may be made upon us.

"These companies are charged with having gone out with their own money to find oil in previously unproductive areas of the world, of developing this production and of winning and keeping for the United States a preeminent place in the world petroleum trade. It is difficult to see how this accomplishment interferes with small business. Certainly no small company has the resources necessary to undertake the development of oil fields in the Middle East.

"However, small companies have up to now been able to export lubricating oils with considerable success and without fear of any oil cartel. As I know from my own experience, the greatest difficulties of lubricating oil exporters in the post-war years have been due to the dollar shortage of European nations, but now the situation has become much more aggravated because lubricating oil refineries have been built in Europe with money furnished by our U. S. government. It is that government action, rather than competition from other companies, or any so-called oil cartel, which gives cause for real alarm."

Reaction of the companies that are being directly attacked has been a series of indignant denials of the charges made. Speaking for Standard Oil Co. (N. J.), President Eugene Holman has repeated the declaration made many times before that the company is a firm believer in the value of competition and is not a party to illegal arrangements of any kind anywhere.

In a letter to Senator Sparkman, W. S. S. Rodgers, chairman of the board of The Texas Co., repeated a statement previously issued denying categorically that the company is a party "directly or indirectly through any subsidiary company, to any international cartel or price-fixing arrangement of any kind, or any monopoly, whether international or domestic." After referring to the company's activities in international fields, the letter concludes: "We hope you will agree that the unsupported charges which have been made and the publicity which has resulted have given the Kremlin a fine talking point in the countries in which we operate. It is difficult enough to carry on operations in foreign countries without being discredited by such actions by our own government. This has hurt not only the oil companies involved, but it will do serious damage to the people of the United States, to our foreign policy, and to our military effort."

Socony-Vacuum Oil Co., denying charges of price discrimination and declaring that its operations have been in full accord with American anti-trust laws and local requirements, added: "It is ironic that after having made a real con

(Please turn to page 74)

EVER SINCE the modern petroleum industry had its birth back in 1859 in the hills of Pennsylvania, a striking characteristic has been its rapid growth. With a few minor exceptions, due to temporary influences, we have become accustomed to seeing the statistics climb higher with every passing year.

The present is no exception: as the final figures for 1951 have come in from producing companies throughout the world, the story they have told has been familiar. Crude oil production is up. New record highs are shown in the United States, in Canada, in Venezuela, in the Middle East, and in the Far East—with one exception.

Inspection of records for crude oil production in 1940, the last full year before Pearl Harbor, compared with last year, shows that every principal producing country in the world has experienced tremendous upturns, except Indonesia, where an actual decrease is found.

Naturally, the first question that arises is: Why? What is going on in those resource-rich islands which once were regarded with such interest as sources of petroleum that the American and Dutch governments fussed at each other for years over the denial of access to United States nationals?

What is the future of the relatively limited reserves of what used to be Netherlands India and is now the independent Republic of Indonesia?

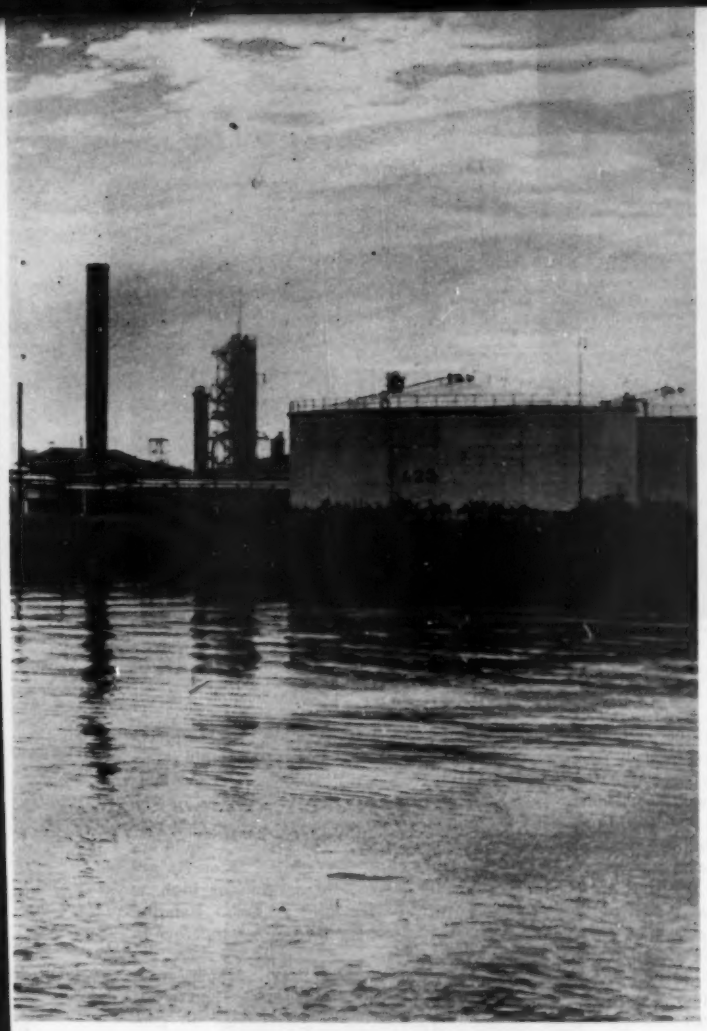
The answer, based upon consideration of a number of factors, physical, technical, economic and political, seems to be that Indonesia's oil future may be very successful or it may be disappointing. As of today, no more precise determination seems justified.

To understand the current situation in Indonesia, it is helpful to have a quick look at the developments which brought it into being. Production in Indonesia began in 1893 under the Dutch, with a modest output of 1,644 barrels daily. There was a steady gain thereafter: up to 11,000 b/d by 1901, to 30,000 b/d in 1909, to 43,000 in 1919 and to 88,000 b/d in 1928. By that year American operations had really begun to make themselves felt. In the following year, the average climbed to 108,000 b/d. The pre-war peak was reached in 1939, at 170,000 b/d.

Meanwhile, of course, refining facilities had been created by the Dutch and American companies, and the then Netherlands East Indies were on their way to becoming an important factor in Eastern Hemisphere petroleum trade.

Then came World War II, thoroughly disrupting NEI operations. The destruction of equipment and plugging of wells to foil the Japanese made it certain that resumption of activities, after cessation of hostilities, would be a slow and difficult undertaking.

Elsewhere in the oil-producing regions of the free world, the war's impact had far different consequences. Venezuela, harried in the first stages by Nazi submarines, forged ahead impressively after the U. S. Navy had cleared the Atlantic. By war's end, production was up to 885,000 barrels daily, and the Caribbean republic was in a strong position to benefit from the peacetime demand that was to follow.



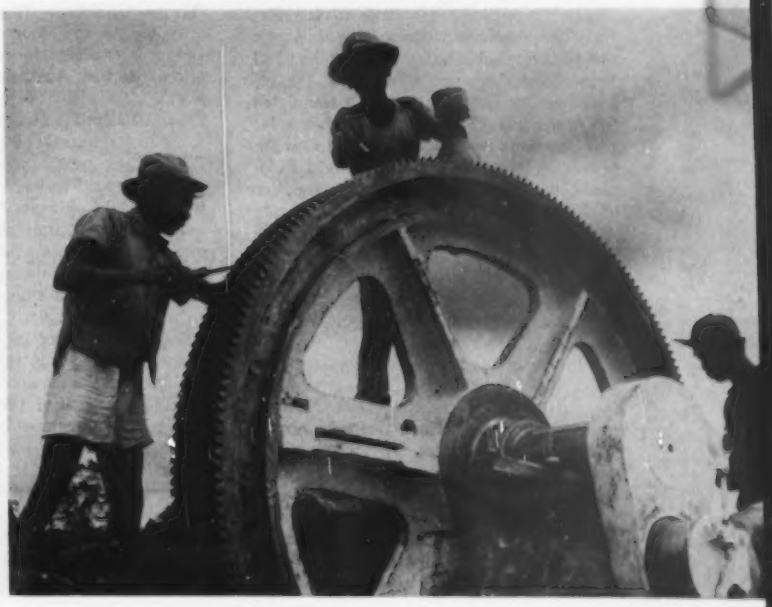
INDONESIA'S OIL SLUMP:

CAN IT BE REVERSED?

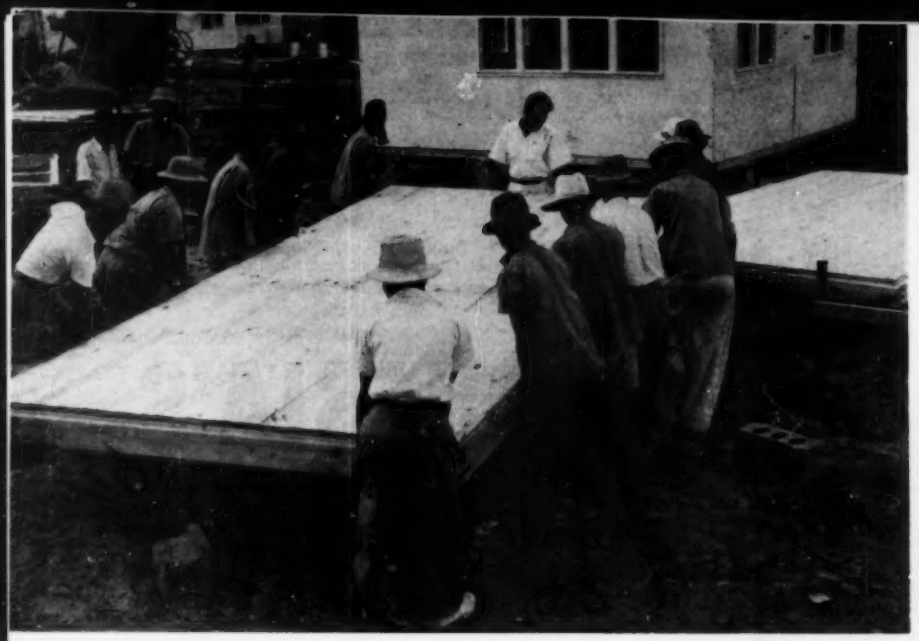
N. V. de Bataafsche Petroleum Mij (Shell) refinery at Pladju, Sumatra, which has a crude capacity of 83,000 b/d, the largest plant in Indonesia.

Much the same results were developing in the Middle East. When Rommel was driven back across Africa, projected expansions at Abadan and Ras Tanura became possible and wells were rehabilitated. The new Abadan facilities were completed during the war, the new Ras Tanura refinery came on stream immediately thereafter, and the Middle East was ready to get on its way again. Although crude production for 1945 (the last war year) was only 358,000 b/d in Iran and 59,000 b/d in Saudi Arabia, the pent-up potential was obvious.

The postwar years have seen these fortunate areas taking full advantage of the momentum which the war gave them. The same years have seen the United States moving forward at a rate which has given red faces to gloomy prophets, and have brought Canada into the limelight as a great new land of promise as far as its oil possibilities are concerned. The figures on production tell part of the story:



Indonesian employees of Caltex Pacific Oil Co. assembling bull gear for large oil pump.



Laying flooring for prefabricated housing at Rumbai, Sumatra, for Caltex Pacific Oil Co., employees.

Sipno, a "roughneck" on Caltex Pacific drilling rig in Minas field.

ANNUAL CRUDE OIL PRODUCTION

(Thousands of barrels)

	1940	1951	% Increase 1951 over 1940
Middle East	103,000	702,000	581
Canada	8,600	47,000	447
Venezuela	186,000	622,000	235
United States	1,353,000	2,244,000	65
Indonesia	62,000	55,000	—11
Other Far East	24,000	52,000	116

This, then, is a picture showing crude oil production rising nearly seven fold in the Middle East, 5½ times in Canada and more than tripling in Venezuela. In contrast, although other Far Eastern production has had a 116 percent gain, the largest producer in the area—Indonesia—was trailing its pre-war record by nearly seven million barrels annually, or 11 percent below the 1940 figure.

It is necessary, of course, to recognize that oil's post-war recovery in the Far East has lagged in some areas principally due to the rehabilitation job that has had to be done since war's end. But the rebuilding has been pretty much completed by now, and the question at issue is: what happens from now forward? Can the biggest factor in the Far East, Indonesia, maintain its position as a supplier of its natural markets, which is to say Australia and New Zealand, Japan, the Philippines, Southeast Asia and possibly portions of India?

To find the answer it is necessary to look at certain determining influences. First of all, Indonesia has less favorable circumstances for its oil exporting program than it had pre-war, and perhaps the principal elements in the changed situation are the tremendous increase in the low-cost production of the Middle East and the noteworthy program of new refineries in the Indonesian trade area.

Plans for almost a score of major new refinery projects and expansion have already been made public, the largest being Anglo-Iranian's 60,000 b/d plant at Freemantle, in West Australia, estimated to cost $90 million. Burmah Shell Co. has announced that its proposed refinery near Bombay will be designed for 40,000 b/d capacity, instead of the 30,000 b/d originally planned, and probably will cost around $50 million. The same company has made known its intention of erecting a 10,000 b/d plant in Pakistan at a cost of about $21 million. Shell has scheduled a 22,000 b/d installation at Geelong, Australia, in the province of Victoria, estimated to cost approximately $11 million.

American companies are also expanding. Standard-Vacuum has plans well advanced for a 20,000 b/d refinery at Altona, Australia, costing approximately $30 million; another at Bombay, with estimated 25,000 b/d capacity, expected to cost about $35 million; and a third at Durban, South Africa, with capacity of 15,000 b/d and expected to cost more than $18 million. Caltex is expected to select Sydney as the site of its new Australian plant, probably about 22,000 b/d capacity, and costing around $56 million. Caltex has announced a 12-14,000-barrel plant project for the Philippines, and another plant near Madras is said to be under consideration, with 20,000 b/d capacity.

At the same time, expansion and modernization projects at Japanese refineries are aimed at advancing that country toward refining self-sufficiency.

Inasmuch as none of the refining projects just mentioned is in Indonesia, it appears that the young republic has a double problem: (1) new and vigorous competition for its refined product exports, and (2) powerful competition for its crude outlet from the low cost fields of the Middle East. Whether it is able to succeed in meeting this competition depends, quite clearly, upon the ability of the operating companies to bring down their costs and keep them down.

Accurate figures on costs are extremely difficult, if not impossible, to obtain, because companies are understandably reluctant to make this information available to their competitors. However, in the opinion of competent production men who are familiar with both areas, it would appear that crude oil costs in Indonesia are probably two or three times as high as they are in the Middle East. Refining costs are probably fairly close together in both areas.

The producing cost margin which favors the Middle East could more than offset the very substantial advantage in geographical location of Indonesia, on both crude and products, in relation to most of its natural markets.

It requires only a glance at the map to understand that Indonesian crude or products are much nearer to such markets as Malaya, Thailand, the Philippines, Japan, Australia and New Zealand than is Middle East oil.

Nevertheless, even in the face of very great disadvantages in tanker distances, Middle Eastern exporters, with the world's lowest production costs, with enormous reserves already proven, and with additional discoveries to be expected, apparently are able to sell crude and products on Indonesia's back doorstep. Part of the explanation of this strange situation is, of course, that Indonesia has now produced enough oil to fully satisfy the demand of these nearby markets. But that is not the complete answer, for with Far East demand rapidly expanding, as it is in all other parts of the world, there would appear to be ample incentive for Indonesian production to increase, rather than decline.

It would seem obvious that the only way in which Indonesian oil can maintain its market position is by greatly increased production. This is a problem which will call for concentrated effort by both the operating companies and the Indonesian

Morning lineup at the clinic maintained by Caltex Pacific at Pakanbaru. Other such clinics are at Rumbai Camp and in the Minas field.

government. Among other things there would seem to be need for a realistic approach to the questions of royalties, taxes, export and import fees and other costs borne by the oil operators.

Perhaps most important to the companies are the recent increases in taxation and export duties. Reports within the industry indicate that the Indonesians have set their sights on a total participation, through royalties, taxes, duties, et cetera, so high that it leaves the companies, Shell, Stanvac and Caltex, little incentive to expand their operations, or even to continue operations on a treadmill basis.

The President's Materials Policy Commission, headed by William S. Paley and appointed to make a thoroughgoing study of the nation's outlook for minerals and energy, commented in its report issued in June:

"Oil companies . . . can live with a 50-50 division of earnings; it is questionable whether they can live — and certainly whether they can expand — under the threat of outright or 'creeping' expropriation."

The Indonesians appear to have been punctillious about holding to their bargains. Moreover, although, understandably enough, they are pridefully conscious of their newly-born independence, they seem to have a feet-on-the-ground understanding of the value to Indonesia of foreign investments and technical and managerial skills. Thus far, however, perhaps because of unfamiliarity with the complex ramifications of operating costs and other factors in the international petroleum trade, and because such products as tin and rubber have historically been the big contributors to revenue, they have possibly overlooked the real potentiality of the oil industry and therefore have not developed a realistic approach to the question of government participation in oil earnings.

In these circumstances, there is little or no justification for the operating companies to enter upon the programs of intensified exploration effort and expansion of facilities which are so clearly called for if Indonesia's petroleum is to have its share of the markets in its area.

The situation was well summarized in the July issue of *Petroleum Press Service*, which noted that the oil companies in Indonesia, hit by higher taxes, the new import duties, and rising costs, "are reluctant to engage in any bold expansion in the present setting of uncertainty as to the future treatment that will be meted out to foreign capital. Instead of development, which the country needs, there may be a standstill or even contraction of oil operations if no reasonable basis for economic operation can be found."

As any oilman knows, production cannot be increased, or even maintained other than for very brief periods, except by continuing exploratory effort, and no company is going to invest large sums in exploration unless it sees a reasonable chance of reward.

In Indonesia, as elsewhere, exploration costs have been mounting steadily. More

An Indonesian surveyor's helper of Caltex Pacific.

Interior of the Standard Vacuum machine shop at Soengeo Gerong, Sumatra, where all sorts of refinery apparatus are repaired.

Sorting valves at the Minas pump station of Caltex Pacific in Sumatra.

A mason at work on foundation for a diesel engine at Caltex Pacific's central pump station.

Welding six-inch pipe near Minas camp of Caltex Pacific.

than ever before, companies must use every practical precaution to spend their exploration money where the chances of profit are commensurate with the large risks they must take.

On this score, Indonesia has far less to offer as an exploration prospect than other areas, particularly the Middle East. Proceeding from the axiom that the object of drilling is to get the most possible oil for the least possible expense, one finds some striking contrasts in the productivity of fields in the Middle and Far East. The average Middle East producing well has a flow of well over 5,000 b/d, whereas in Indonesia it is less than 100 b/d.

On the negative side, then, one finds Indonesia with relatively small production, very little current incentive for the companies to search for new reserves or to increase production, a mushrooming of new refineries in Australia and the Far East to compete with Indonesia's petroleum products, and tremendous low-cost production from the Middle East to compete with its crude oil.

What of the positive side? The most promising factor is the very large and progressively increasing demand for petroleum and petroleum products throughout the free world. Eloquent evidence in this respect is presented by the previously mentioned Paley Commission report.

This report, which is probably the most comprehensive study of the world materials situation ever undertaken, makes none of the old, discredited predictions that "we are running out of oil," but it does forecast a mounting demand for the next 25 years, not only for the United States, but even greater proportionally for the world as a whole.

Of course, barring a devastating war, the United States will continue to supply its own needs, with supplemental supplies from Latin America, Canada, and the Middle East. Latin America is likely to continue its self sufficiency. Europe will almost certainly satisfy increasing proportions of its requirements from Middle Eastern sources.

So, there is little likelihood that Indonesia will become a major factor in world petroleum trade in the foreseeable future. However, if Indonesian crude and products can be made available in sufficient volume, they may do very well in the markets of that part of the globe, as long as Middle East oil continues to find abundant outlets elsewhere. Indonesia's refineries are so close to Manila that it seems inconceivable that any other source should be able to compete successfully in the Philippines. The same can be said of Singapore and other Far East ports.

In trying to forecast whether Indonesian oil will, in fact, be able to take advantage of the opportunities which the future seems to offer, one can come to no other conclusion than that the answer depends upon the ability of the Indonesian government and the operating companies to cooperate to their mutual benefit.

The Indonesians, while understandably insisting upon an equitable share in the benefits of their natural resources, should recognize that there may be no benefits at all from these resources unless they provide an economic and political climate which will enable and encourage the operating companies to find more oil.

The Indonesians certainly know that people are going to buy oil, just as they buy food or clothing or any other commodity, where they can do so most advantageously.

It must be rather evident, also, that people don't usually go around the world looking for oil to buy: they buy it because sales representatives come to sell it to them, and because transportation facilities deliver it to them.

These are two indispensable elements in the international petroleum trade which are too often overlooked by those on the outside. Worldwide marketing organizations are worldwide transportation systems, tanker fleets, port and storage facilities, and the intricate systems of truck, tank car and pipeline movements that get the oil to consumers. All of these represent millions of dollars of investment and years of learning-by-experience. Company management, if it follows the best interests of its stockholders, is going to concentrate these marketing and transport organizations upon those oil sources where the profit possibilities are attractive.

Moreover, bearing in mind that Indonesia has other natural resources, in addition to petroleum, which afford great potentialities for the benefit of the nation, one assumes that the government is aware that good treatment of capital in one industry will encourage investment in other industries. Surely this is a desirable trend in a young nation eager to improve its economic position.

In summary, if the Indonesian government can agree with the oil companies on terms of operation which will justify new investments in exploration, drilling and expansion of facilities for the long term, then there is reasonable basis for believing, as was stated earlier, that Indonesia's oil future may be good.

If so, the beneficiaries will not be merely the operating companies, because expanding oil activity will certainly mean expanding revenues for the Indonesian government down through the years, and also, through wage payments and local expenditures, an increasingly beneficial factor in the progress and stability of the young republic's economy.

TRADE AGREEMENT REDUCES OIL TARIFF

By Joseph Huttlinger

UNDER A TRADE AGREEMENT signed last month between the United States and Venezuela, following negotiations that have been under way since the beginning of the year and a study of the subject by the Tariff Commission, a reduction in tariff rates applying to a large volume of oil imports will go into effect at an early date, possibly by October 1. The new tariff schedule, as it applies to petroleum products entering the United States, has been determined as shown in Table I below.

Under reciprocal trade authority, the negotiators representing the United States could have gone as low as 5½ cents a barrel across the board. Accordingly, the use of a 25-degree dividing line is termed a compromise. One reason for this, presumably, was a report by the U. S. Tariff Commission, called in to fix a "peril point" below which the duty might be injurious to this country's economy.

Three members of the commission held that a tax of 10.5 cents a barrel for crude oil and residual fuel marked the peril point, while the other three said the higher tariffs that have been in effect heretofore constitute a reasonable limit. The President has the power to overrule the commission and exercised the final decision.

Under the quota system of the past two years, the average tax during 1951 for crude oil, topped crude and residual oil, the bulk of the imports from Venezuela, worked out to about 17 to 18 cents a barrel, according to the estimate of one economist. Under the new tax system, after allowing for the different rates for above and below 25 degree gravity oils, the figure is expected to average out to seven to eight cents a barrel.

In a message informing Congress of the agreement, which was signed Aug. 28 at Caracas, President Truman spoke of common trade interests between the two nations and gave some details of the document. He explained that most of the domestic production of crude petroleum is of specific gravity of 25° API or higher and most of the imports are of lower than 25° gravity.

"The imported oils which would pay the lower tax," he stated, "are among those which are in relatively short supply in the United States and generally throughout the world.

"It is not expected that the lower tax applicable to such oils will cause an undue increase in imports above the quantity which otherwise might be imported.

"It would appear, accordingly, that the lower tax on residual fuel oil would not serve to disturb the relationship which now exists in the United States between this fuel and other sources of heat and energy."

Of the common interests between the two nations, the President said:

"The conclusion of the supplementary trade agreement is recognition by both the United States and Venezuela of a common interest in the expansion of trade.

"Venezuela is one of the largest markets for a wide range of United States export products. The United States provides an important and established market for Venezuelan oil, this representing, in turn, an essential supplement to domestic United States production.

"The United States will also provide a market for other Venezuelan natural resources, such as iron ore, which are needed in this country. The agreement, therefore, will be of economic benefit to both countries. It is, moreover, of vital security importance in view of the strategic nature of some of the products included within its terms."

The agreement became the target of attack from coal men, who express fear that it may result in loss of their East Coast market for four million tons of coal monthly in utility plants, and of independent oil producers, who declare that domestic production may be lowered by competition from oil imports.

The Independent Petroleum Association of America said the chief immediate effect is to give oil importing companies "a price increase" of $30 million a year. The organization named Standard Oil Co. (N. J.) and the Royal/Dutch Shell group as likely to gain most by the change.

No one in authority, however, foresaw any immediate sharp rise in oil imports stemming from the agreement. The IPAA's general counsel, Russell B. Brown, said:

"While the amount of the tax reduction may not be a factor in influencing increased imports, the expression of government policy embodied in such action will be an important factor." He pointed out that virtually all oil companies involved have subscribed to a national oil policy calling for imports only to supplement United States production.

Under most favored nation pacts, the lower duties are accorded all nations, although Venezuela is the chief source of oil imports to the United States.

Meanwhile, the announcement of the pact raised two questions which only the future can answer. One is whether new oil areas will be opened by Venezuela for exploration and development. The other is whether Congress will be the scene of renewed opposition to oil imports next year as a result of the pact.

TABLE I

	New Import Tax	Old Import Tax
Crude petroleum, topped crude petroleum, and fuel oil derived from petroleum (including fuel oil known as gas oil):		
Testing under 25 degrees API	5¼c bbl.	10½ to 21c bbl.*
Testing 25 degrees API or more	10½c bbl.	10½ to 21c bbl.*
Liquid derivatives of crude petroleum (except mineral oil of medicinal grade and except any product described in any other item 3422 of this Schedule)	10½c bbl.	10½c bbl.
Gasoline or other motor fuel	52½c bbl.	52½c bbl.
Lubricating oil	84c bbl.	84c bbl.
Paraffin and other petroleum wax products	½c pound	½c pound

* The tax has been 10.5 cents a bbl. on imports of crude, topped crude and fuel oil from all sources up to a yearly quota equal to five percent of U. S. refinery runs in the preceding year. For oil above the quota, about 300,000 barrels daily on an annual average, the duty has been 21 cents a barrel.

IRAQ'S NEW PIPE LINES TO TRIPLE PRODUCTION

CONSTRUCTION of the 30-32-inch pipe line extending from the Kirkuk field to Banias, Lebanon, on the eastern shore of the Mediterranean, marked the beginning of a new era for the Iraq Petroleum Company. It is the third transportation system built by the company, following the original line of 12-inch diameter, completed in 1934, and a parallel 16-inch line laid in 1949.

Owing to the location of the Kirkuk field, far removed from a shipping port, production is limited to the carrying capacity of its pipe line connection. The original system with its two branches was capable of moving some 80,000 barrels per day. The 16-inch line, following an exactly parallel course, was expected to increase capacity to two and a half times that figure, but the troubles between the Arab states and Israel made it impossible

to complete the southern fork beyond the border of Transjordan and also forced suspension of service through the southern branch of the original line terminating at Haifa. Available capacity, therefore, was restricted to the Kirkuk-Tripoli portion of the system at about 150,000 barrels daily.

To meet the rapidly expanding demand for Middle East oil and to utilize more of the great potential of the Kirkuk field, it was decided to construct a line of much larger diameter, following the same route as the northern branches of the two earlier lines, but terminating at Banias instead of Tripoli.

Oil began to flow through this 30-32-inch line in April last. When in full operation it will have a yearly capacity of 14,000,000 tons, or roundly 300,000 barrels daily. With 8,000,000 tons added by the separate pipe line in the south, connecting the Zubair field with the port of Fao, the outlets for oil from Iraq territory will accommodate 450,000 barrels daily by 1954.

An important tributary to the main artery of the system is a feeder line of 12-inch diameter which connects the Ain Zalah field north of Mosul with the big-inch line at pumping station K2. This line was completed late in August and is expected to add 2,000,000 tons to the system's yearly flow, beginning with 1953.

The total length of the 30-32-inch line from Kirkuk to the Mediterranean terminal at Banias is 556 miles and the cost was £43,000,000 ($120,400,000). It was first planned in 1947, but owing to shortages of steel and equipment it was impossible to commence construction until September, 1950.

The Arabian Bechtel Corp. was appointed main contractor for the work, owing to its past experience in the Middle East on the building of the Trans-Arabian pipe line, and the company had as consultants the British firm of George Wimpey & Co., Ltd.

The work was carried out from both the western and eastern ends and was begun at Homs, where the first base camp was established with living quarters for all classes of personnel, offices, garages, workshops for maintenance of plant, and the main pipe welding station, together with mess and recreation halls.

All the steel for the pipe came from the United States, but equipment and materials for the pumping stations along the route of the line came from the United Kingdom. 160,000 tons of pipe were shipped in two sizes: 30-inch and 32-inch. Shipment in these two sizes enabled the 30-inch pipe to be nested in the 32-inch, thus halving the shipping space of this portion of the transport. Part of the pipe was routed by sea to Tripoli, Lebanon, and part to Basrah. In order to balance pressures in the line, certain sections consisted of 26-inch diameter pipe, of which 26,000 tons were used.

At the former post, discharge was first made into barges, as the ships had to lie about a mile off shore, there not being sufficient depth of water in the port for berthing, and from the barges it was loaded onto railways for transportation to Homs. At Basrah there was sufficient depth of water for ships to lie alongside the wharf and discharge directly into rail and motor trucks which transported it to the base camp at Baiji, where work on the eastern section of the line was done. Each track carried 10 nested lengths of pipe, 20 in all.

After the pipe was unloaded at Homs, it was transferred to the de-nesting plant which gripped the outer pipe while the inner one was drawn away, and then both were stacked in their respective places according to size.

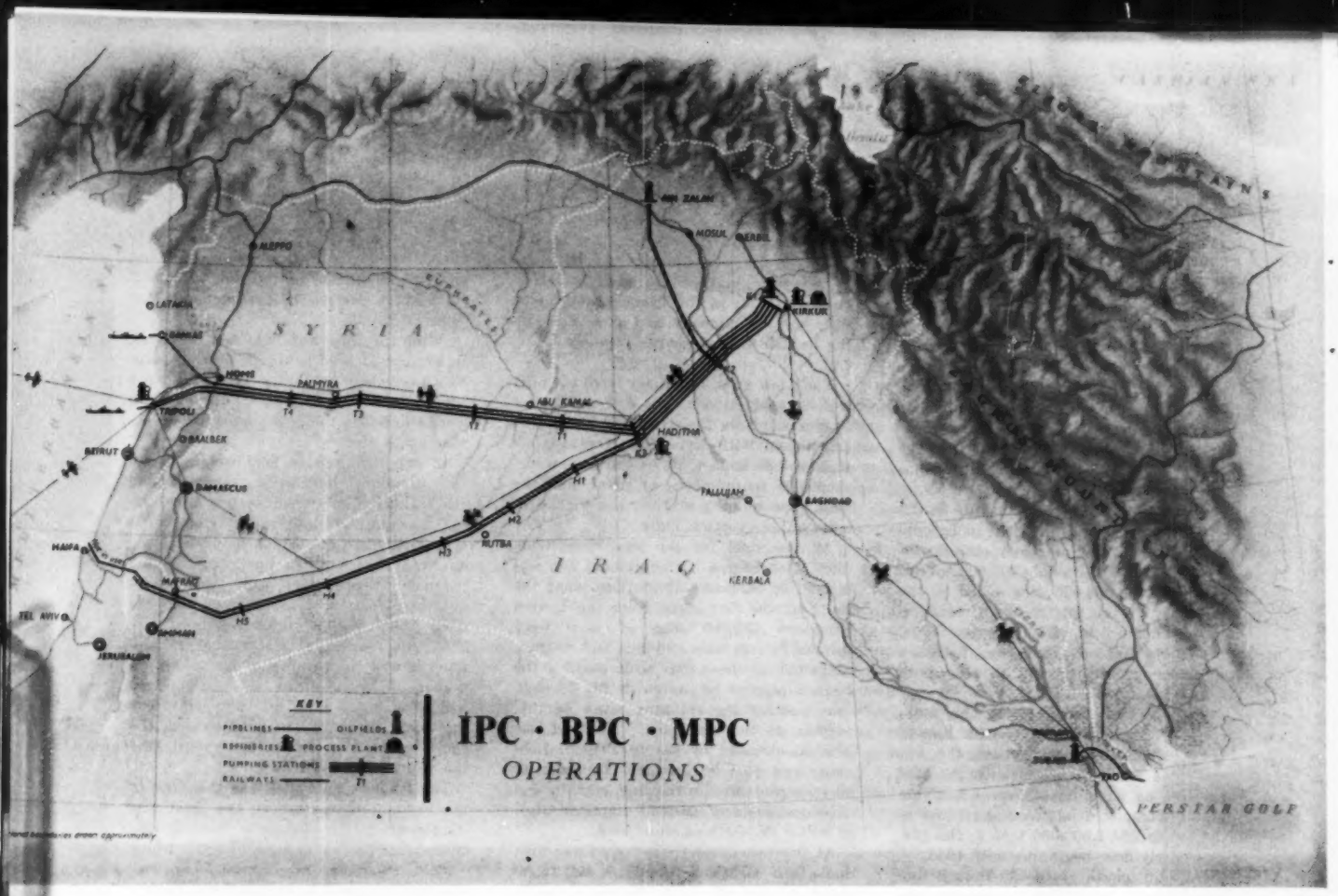
In order to reduce field welding with its attendant difficulties, climatic and others, an automatic submerged arc welding machine was installed at Homs of a type similar to one which had been used on the Trans-Arabian line. In this department three pipes were welded together to form a 98-foot length, thus reducing field welding to one third.

In this welding at Homs, the first operation was the joining of the pipes together by means of an automatic clamp which accurately lined up each joint. The joint was then stringer bead welded, the clamp withdrawn to the next joint, and the operation repeated.

The 93-foot long pipe was then fed to the welding house, where the weld was completed by the automatic welding machine. The 93-foot lengths of welded pipe were then loaded onto a 250 bhp six-wheeled tractor, known as the "Mighty Antar," 35 of which had been specially made by John I. Thornycroft & Co., Ltd. for this purpose, and which were capable

Two major river crossings on the Kirkuk-Banias line were the Tigris and the Euphrates. Shown here are ends of all four 16-inch lines at the east bank of the Euphrates ready to be tied into the main 30-32 inch artery after a 1,400-foot pull.

Temple of Bel, central structure among the ruins of the fabulous city of Palmyra on the Syrian desert, past which the Kirkuk-Banias Pipeline was laid. Palmyra flourished early in the Christian era and may have been founded by King Solomon. Unless other wise noted, all photographs by Richard Finnie for Bechtel Corp.



of carrying 65 tons of pipe, loaded on special dollies, at one time.

These tractors acted as stringers for the pipe lines. On arriving at its destination, the pipe was unloaded singly into position by Coles side boom cranes fitted on caterpillar tractors, where it was ready for placing into position and joining up when required. For the joining up operation, the pipe was aligned with the previously laid section. The ends, previously beveled, were placed in conjunction and held there by a clamp similar to that used in the earlier welding operations and then welding was done by hand.

The welders were followed, first by the cleaning machine, which removed all mill scale by means of knives, and then by another which removed any residue of rust by brushes, leaving the pipe clean for the priming coat of coal tar. After the primer was applied and allowed to dry it was carefully cleaned by hand ready for the next operation of coating and wrapping.

With the pipe suspended from the side booms, the Perrault machine first applied a coating of hot tar; then, while the tar was still hot, a band of Fiberglas was wrapped around spirally, followed by another coating of coal tar and finally a band of bituminous asbestos pipe wrapping to protect the tar coating.

Ahead of the pipe laying and insulating gangs, the excavating gang prepared the pipe trench, which, where the ground was suitable, was made by Ruston "Bucyrus" ditchers. These laid the earth and rocks to one side of the ditch, ready for the refill after the pipe was in position. When rocky ground was encountered, which was the case over a large portion of the route, blasting had to be resorted to, after which the "Bucyrus" removed the debris.

After removal of all rough debris from the bottom of the trench it was made ready for reception of the pipe, which was done by padding it with earth, screened from stones to a depth of six inches. The cleaning and padding were done by manual labor.

The joined-up and wrapped pipe was then lowered into the ditch by a number of side booms, after which it was covered by screened earth to a depth of six inches and the ditch filled in by mechanical shovels.

In order to increase production before the whole of the 30-32-inch line was strung, it was temporarily connected to the dormant 16-inch line of the southern leg at K3 pumping station.

The design of the pipe line provided that the seaward end, a 90-mile stretch from Homs Gap, 2,573 feet above sea level to the port of Banias, should be 26-inch pipe, and the first shipment of this reached Tripoli on November 5, 1950.

Construction and pipe laying started in the rainy season, which that year was abnormal, the rain being so heavy that the ditch excavated to receive the pipe was flooded. In spite of this, the target rate of 13 miles per month was achieved by the end of January. In February, 30 miles were completed with coating and burying following only 7 miles behind the welding gang. During the succeeding dry months the pace quickened. In September the line was over the Tigris from the eastern end and more than half of the Euphrates crossing had been welded. In October the line was across the Euphrates and 45 miles were laid during the month. Wet weather in November reduced the welding to 43 miles, 48 miles coated and wrapped, and 38 miles back filled. Bad weather in December meant only 37 miles welded, but by then the total, including the 26″ pipe line, had reached 335 miles of the 556-mile total, 308 being back filled. The whole line is now complete, including the last 130 miles from K3 to Kirkuk.

During the laying of the pipe line, construction work on the pumping stations was carried on and by the end of 1951 approximately 18 percent of the work had been completed, including extensions to

the main manifold at the new T2 pump station to enable the new line to be filled and tested without interfering with the operation of the 12″ and 16″ lines.

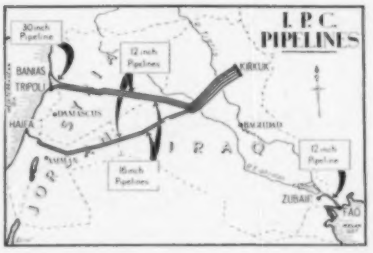
At the Banias terminal the motor transport garage and workshop, the carpenters' and blacksmiths' shops, and the electrical, paint, oil and cement stores were completed and in service by the end of the year. In the tank farm eight of the crude oil storage tanks together with pipe work and fire walls have been completed. Six sea loading lines have been pulled and connected to the fore shore pipe work.

A small boat harbor has been built to accommodate the launches and small boats necessary to operate the terminal.

Pumping Installations

When the first 12-inch lines were laid, a total of 12 pumping stations was provided: the first three, K1-K3, serviced both branches of the line to Haditha, where the line bifurcated; from Haditha to Tripoli there were four stations, T1-T4; and from Haditha to Haifa 5, H1-H5. Stations K1, K2 and K3, situated respectively five miles west of the Kirkuk field, 10 miles west of the Tigris, and 1½ miles west of the Euphrates, were double pumping stations, each capable of pumping 11,200 tons per day. The T stations on the northern leg and the H stations on the southern are each capable of pumping 5,600 tons per day.

The pumping units were 6¾″ x 24″



Map showing diameter of lines in various parts of the system.

horizontal Duplex double-acting Worthington-Simpson pumps working at 800 psi and direct coupled to 500 hp diesel engines, there being six units at each of the K stations, and three at each of the H & T stations. Fuel for the diesels is crude oil taken direct from the pipe line. The engines and pumping units are separated by gas-tight fire walls. Auxiliary equipment includes 8″ x 10″ piston-type suction pumps for emptying sections of the pipe line in case of necessity and 4″ x 6″ piston-type sump pumps for handling drainage or slop oil.

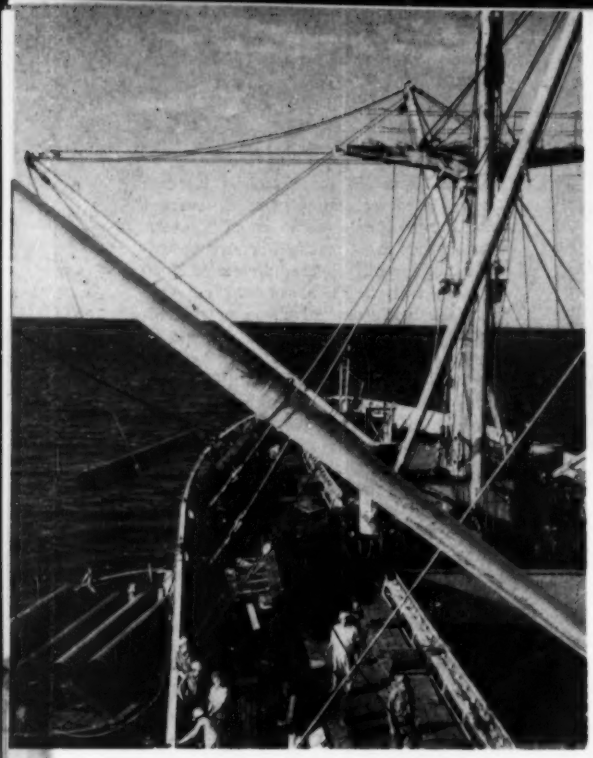
When the 16-inch line was laid, the K stations were enlarged and the existing reciprocating pumps replaced by Mather & Platt motor driven centrifugal pumps, each of 156,000 barrels per day capacity at 500 psi. Each of these pumps in stations K2 and K3 is driven by its own 1,800 hp motor, supplied with current direct from its diesel-driven alternators. The engines are Crossley-Premier 16 cylinder horizontally-opposed diesels of 2,000 hp. At station K1 power was supplied from the field's central power station direct to the pump motors. The alternators in stations K2 and K3 were made by English Electric Co. The T and H stations each have four reciprocating pumps, each of 51,700 barrels per day capacity.

For servicing the 30-32-inch line, the locations of pumping stations K1-K3 and T1-T4 have been retained, but they have been completely reorganized.

K2 and K3 stations consist of a generator house and a separate pump house. The prime movers consist of Crossley-Premier vis-a-vis diesel engines, in two units of 1,000 hp each, coupled together with a fly-wheel alternator in between, the set thus developing 2,000 hp. The engines are supercharged and run at 250 rpm full speed, but can operate down to 120 rpm.

The alternator is rated at 1,560 KVA, 3,300 volt 3-phase 50-cycles, and is separately excited by a main exciter 67 v-DC 100 amps, 980 rpm having liberal short rated overload capacity. There is a pilot exciter producing 110 v-DC 1.9 amps, coupled to the main exciter, both being driven together by a 15 bhp 400 v-AC squirrel cage motor, the power for which is taken from the station supply.

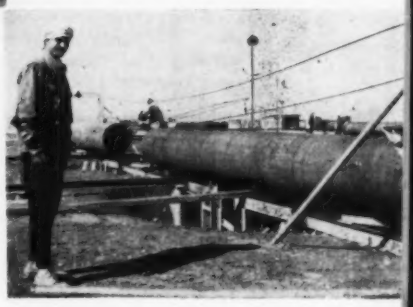
Bottom-padding crew at work on ditch near Abrach River on the 26-inch portion of IPC Kurkuk-Banias pipe line.



Nested 30-32 inch pipe joints for the Kirkuk-Banias project being off-loaded from a Liberty ship in Tripoli harbor, Lebanon. One of these ships could carry 18 miles of the big pipe.

Trainload of nested 30-32 inch pipe leaving Tripoli, Lebanon, for Homs, Syria.

Denesting of 30-32 inch pipe joints at Homs, Syria.



Seven of these units operate in the generator house, each alternator being connected to its individual motor by means of 3-core 0.3 sq. in. 3.3 KV paper covered cable without intervening switch gear, the motor pumping sets being in a separate pump house about 130 feet distant.

In the generating house are also the auxiliary alternators for supplying all the auxiliary power required for the station, through 3.3 KV/400/230 v transformers where necessary. These alternators, of which there are five, are each of .875 KVA capacity, 3,300 volt 3 phase 50 cycles, and are driven by the same type of 8-cylinder horizontal Crossley-Premier diesel engines.

With this set-up the pumping is extremely flexible, as the output can be controlled directly by the speed of the engine, and sudden rises of pressure with their possible adverse influences are avoided.

The method of starting up the pumping units in the absence of switch gear is by excitation of the alternator when running at about half speed. The engine is started and then run up to about 125 rpm during which period the alternator is not excited and therefore the pump motor remains at rest. When the pump and manifold valves to the line have been set, and all is ready for the flow of oil, the alternator is over-excited and the 1,800 bhp main line motor and pump begin to rotate slowly and gradually attain a speed corresponding to 25-cycle current. Afterwards the engine is accelerated to the required speed, the pump speed being increased accordingly, and then the excitation is adjusted to give the optimum power factor.

Eventually, eight of these units will be installed in each of the K stations, giving a pumping capacity of 25 million tons per annum with adequate stand-by. Five of these sets will be required for deliveries through the 30-32-inch line.

The motors are 3,300-volt, 50-cycle, three-phase 1,800 bhp and are cooled by forced draught. They were supplied by English Electric Co. and are direct-coupled to Mather & Platt Size V, 6 stage, horizontal "Plurovane" pumps, each 30-32-inch main pump being designed to deliver 105,000 b/d (about 15,000 tons) against a total head of 2,025 ft. (730 psi) when running at 1,485 rpm and pumping oil with a specific gravity of 0.843.

With pressures of this order in the system, the problems of flange joint closure become acute, as the strength of ordinary mild steel bolts of standard size is inadequate for this purpose. Special high tension chromium-molybdenum steel bolts made by A. P. Newall & Co. Ltd. have been universally used for this purpose on all the lines. To avoid freezing, the nuts used are of ordinary mild steel. These nuts are Newall "Hitensile" quality, and are heat-treated after machining to an ultimate tensile of 45/55 tons.

The threads on the bolts and stud bolts are generated threads which are produced by rolling between cylindrical dies, and are a great advance on other types of thread in accuracy and strength, and especially in resistance to fatigue and also to seizure under extremes of temperature.

Control of the oil system is through a manifold outside the pumphouse. Normally, the oil on the suction side is fed through this manifold to the pumps, but balance tanks are provided to take care of emergencies and to trim the throughput of the main line. If and when required, oil from these tanks can be pumped into the main line suctions by means of low pressure booster pumps of Mather & Platt's "Medivane" type driven by Metropolitan-Vickers motors. The capacity of one booster pump equals that of a main pump, the delivery pressure, however, being only 60 psi on full load.

The control rooms are equipped with an instrument panel on which are mounted alarms and indicators in connection with a comprehensive system of main pump and motor protection, which indicates any divergence from normal operation, such as overheating of bearings and failure of main pump suction pressure, and incorporates the normal electrical protection for the main motors.

The panel also carries pressure gauges and flow-metering and controlling devices. In an emergency, to prevent extensive damage to the main pump, a set will automatically be shut down.

The pressure gauges were supplied by Budenberg Gauge Co. and the controlling and metering devices by George Kent, Ltd. and Elliott Bros. (London), Ltd. Water being a scarce commodity at these pumping stations, the cooling water, after passing through the engine-jackets, is recooled in heat exchangers against the incoming oil stream. These exchangers were supplied by Head Wrightson Processes, Ltd.

Treatment of the crude oil

The crude oil which is collected in the gathering system from the wells contains about 200 cu. ft. of dissolved gas per barrel. This gas is of the usual sulfurous nature, is poisonous, highly corrosive, and has an objectionable smell. Its removal before the oil enters the pipeline systems is very desirable in order to avoid corrosion and the development of a nuisance

Thirty-inch pipe sections 93 feet long being unloaded from a British Antar truck along the Kirkuk-Banias right-of-way. As many as nine sections, weighing 54 tons, made up a load.

Lining-up and welding crew on a typical stretch of desert where temperatures range from below freezing in January to 120 degrees in July.

Triple-jointing yard at Homs, Syria, where after de-nesting, the pipe was welded into 93-foot sections, thus saving time on the right-of-way.

Pipe being double-coated and double-wrapped with hot coal-tar enamel.

at the various storage points before transport overseas and before refining.

The writer well remembers an incident at Le Havre, shortly after the arrival of the first cargo there from Tripoli, before the de-gassing stations and stabilizing plants were in full operation.

A few days after the discharge of this cargo, a very agitated phone call came from that port, saying that the white paintwork of many of the pleasure yachts based on that port, one of which belonged to the caller, had gone black, and what was the cause and what could be done about it. The cause was easy to identify but the immediate cure was much more difficult. The ultimate cure was the stabilization of the crude prior to shipment, which entails the removal of the dissolved gases.

The whole of the crude coming from the well heads now passes first through the de-gassing stations and then to the stabilization plant, the whole of the sulfurated hydrogen being removed, the treated crude having a Reid vapor pressure of only four psi.

In order to conserve the well-head pressure at a point sufficient to drive the crude oil to the gas separators which work at 50 psi, the flow from the well-heads is carefully controlled through flow lines of various sizes which minimize the pressure drop due to friction and gas pockets.

(Please turn to page 72)

Lowering-in the pipe line, constructed for IPC by Arabian Bechtel Company.

LOST CIRCULATION IN THE GULF COAST AREA

David D. Dawson, Jr., author of the accompanying report on a study of lost circulation in the Gulf Coast areas, has been engaged for the past two years as a member of a research group studying the problem. He is a specialist in drilling muds and has served the Gulf organization in Kuwait and in Louisiana and Texas since he joined the company at the end of his war service in 1947. Prior to World War II, Mr. Dawson was employed by Sinclair Refining Co. as an engineering trainee for nearly a year after his graduation from Rice Institute in Houston. Associated with Mr. Dawson in the lost circulation study were A. J. Teplitz of Gulf Research and Development Co., W. C. Goins, Jr., Houston Chemical Laboratory, and J. L. Burba, Jr., and J. P. Weichert of the Gulf production department. The paper was presented before the Sixth Production Engineering Conference of Gulf Oil Corp. at Pittsburgh last June and is reproduced here through the courtesy of Dr. Paul D. Foote, executive vice president of Gulf Research and Development Co.

Fig. 1. Examples of balling in the J. H. Caldwell et al No. 1 well in the Peach Point, Texas, field.

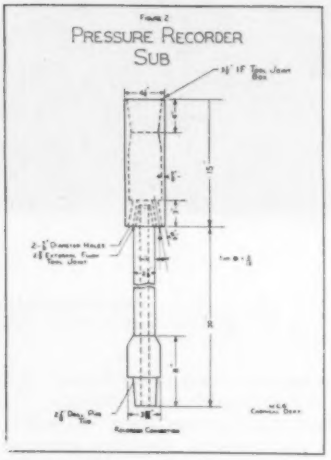


Fig. 2. Recorder sub for measuring pressure variations due to moving pipe in the hole.

By D. D. Dawson

IN GENERAL, lost circulation may be divided into two classifications: first, those losses due to highly permeable or cavernous formations; second, losses caused by drilling fluid pressures exceeding the structural strength of the formation. These excessive pressures may fracture the formation in zones of weakness or stress, or open existing fractures. There are several reasons for believing that the losses in the Peach Point Field in Texas, at least, were of the second type.

All the formations in or adjacent to the loss zones in this field were either shale, sandy shale, or relatively fine sand, which would not structurally support cavernous or highly permeable sections. Extensive coring showed no cavernous porosity. With two exceptions, the formation always supported hydrostatic pressure, as evidenced by the fact that the hole would stand full of mud after loss of circulation. This fact indicates that losses were not to porous or cavernous sections of low internal pressure.

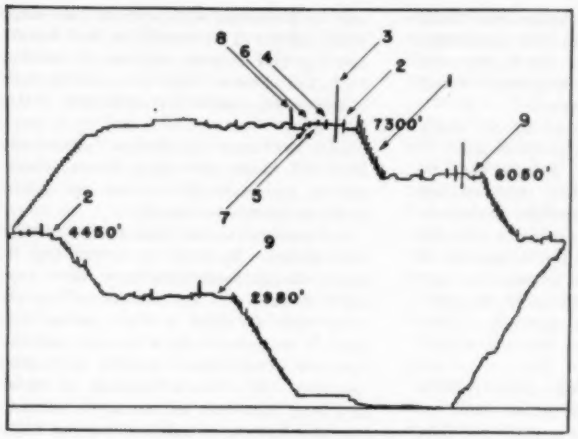
A number of cores contained fractures which were closed until broken open. This would indicate that fractures closed by compaction were possibly re-opened by fluid pressure when loss occurred. Vertical fractures were found in ten of the cores taken on S. S. Perry No. 2, and in two cores from J. H. Caldwell No. 1. Losses resulted while drilling in or adjacent to nine of these twelve fractures. Although it cannot be conclusively proven that there was a direct relationship between fractures and losses, it seems probable that such a relationship existed. The evidence indicated that fractures were not a direct cause of loss, but merely provided weak points for formation breakdown due to pressure build up in excess of hydrostatic pressure. It cannot be determined whether any new fracturing of the formation occurred at points where no fractures previously existed, but this seems probable in those instances where there were losses but no fractures found in the cores.

All the evidence pointed to pressure build up in excess of hydrostatic pressure as being the primary cause of loss of circulation. Of all the losses on wells drilled in the Peach Point field, there were only two cases of loss where the formation would not support hydrostatic pressure. In all other instances the hole stood full even though normal circulation of the mud column was not possible, proving that additional pressures over hydrostatic were responsible for the losses.

As further evidence of this fact, results of a total of 25 successful spinner surveys run in the Gulf Coast district revealed that there was only one case where the point of loss was found to be on bottom. In all other cases the formation had ruptured in a section of the open hole higher than total depth. This would indicate that these sections were broken down by pressure surges above hydrostatic pressure after they had been drilled.

These pressure fluctuations are attributable to several causes:

1. *Balling:* This condition is caused by shale cuttings or fragments plastering around the drill collars and bit, and/or tool joints. Since this decreases the size of the annulus, a larger portion of the pump pressure is transmitted to the formation. Also, working the balled pipe increases the swabbing and piston action effect in the open hole, with a resulting increase in pressure below the point of balling. The photographs shown in Figure 1 may give some idea as to the degree of balling which is frequently encountered in drilling wells in this area.



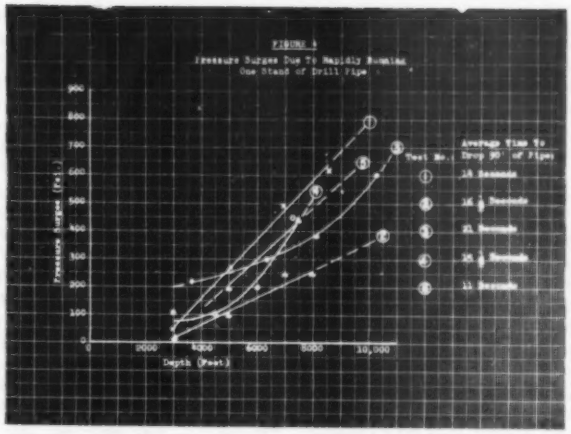


Fig. 3. Pressure recorder chart from Test 4, employing 7,500 psi maximum drill stem test pressure recorder.

KEY

1. *Running Pipe*
2. *Rapidly breaking circulation*
3. *Rapidly spudding 35 feet of pipe while circulating*
4. *Rapidly withdrawing 35 feet of pipe while circulating*
5. *Slowly spudding with 35 feet of pipe while circulating*
6. *Slowly withdrawing 35 feet of pipe while circulating*
7. *Circulation stopped*
8. *Rapidly running one 90-foot stand*
9. *Circulation started slowly*

The study group observed a total of 32 losses in the Peach Point Field, and balling was directly associated with 12 instances of loss.

2. *Working the pipe:* When the drill pipe is rapidly lowered into the hole while drilling, or during a trip, a pressure increase in the open hole is to be expected. These additional pressures, in conjunction with hydrostatic pressure, may be sufficient to rupture the formation.

Pipe movement was associated with 14 of the 32 losses at Peach Point. There were nine cases where balling and pipe movement both occurred at the time of loss. At Little Chenier, 11 of the total of 13 losses occurred within a short time after a pronounced pipe movement.

To illustrate that pressure surges may cause loss of circulation, there were two instances at Peach Point where circulation was normal before a trip, but after the pipe was run back to bottom and circulation started only partial returns were received. In several other instances circulation was lost shortly after a trip had been made. The only apparent explanation of these occurrences is that the formation was broken down by the piston action of the drill pipe as it was being run into the hole.

On the other hand, a sudden drop in pressure occurs when the drill pipe is raised rapidly. This effect, known as "swabbing," while it may not be a direct cause of loss of circulation, appears to have almost as harmful results as the piston action caused by a sudden lowering of the pipe. It makes higher mud weights necessary, thus increasing the probability of loss. Cannon[1] has measured the magnitude of this swabbing effect under varying conditions of hole and drill pipe size, length of pipe in the hole, and with various mud properties. He concluded that gel strength of the mud and length of drill pipe in the hole are the major factors governing the amount of pressure drop occurring when the drill pipe is withdrawn. For example, at a depth of 6,000 feet, a pressure drop of over 400 psi is possible due to swabbing with 3½-inch drill pipe in 7-inch casing. Topping[2] has presented the theory that collapse of a deep well bore due to the reduction of internal pressure may be caused by swabbing.

After the foregoing observations on the effect of pipe movements were made, the study group decided to make measurements of the pressures developed when pipe is moved in the hole. A sub was designed, as shown in Figure 2, to replace the bit. It had two ⅝-inch diameter bit ports to allow circulation, and two pressure recorders were connected by a 2¾-inch OD mandril to the bit sub. This placed the measuring element of the top pressure recorder 49 inches from the bit ports. These instruments were 7,500 or 15,000 psi maximum drill stem test pressure recorders. With these instruments tests were run in several wells where the pressure fluctuations due to running and pulling pipe were determined at various depths.

To date, five such tests have been made. Figure 3 shows the pressure recorder chart from test No. 4 run at North Black Bay, Louisiana. Figure 4 shows the pressure surges due to rapidly spudding one stand of drill pipe in all five tests. The pressure surges due to rapidly spudding 35 feet of pipe while circulating are shown for four tests in Figure 5. It appeared that the pressure surges were greatest when pumping was in progress, although they were still as large with the pump off, as when running the pipe to bottom. The magnitude of the surges increased both with length of the pipe string and rate of pipe movement.

It has often been observed in a given well that a few tenths of a pound per gallon increase in mud density may be sufficient to cause loss of circulation, and for purposes of comparison it is well to evaluate the pressure surges in these terms. Taking the results of test No. 4 at 8,000 feet, the pressure surge due to rapidly spudding the pipe with the pump on was 950 psi, and for rapidly running a stand it was 525 psi. These are equivalent to a momentary increase in mud density of 2.3 and 1.3 lbs/gal., respectively. It seems certain that these surges are great enough to be a major factor in causing loss of circulation. This confirmed the observations of loss of circulation in the first three wells drilled, where a large percentage of losses occurred after working the pipe.

Figure 6 shows the pressure surges resulting from slowly running one stand of drill pipe, and Figure 7 gives the same data for slowly spudding 35 feet of pipe while circulating. In comparison with Test 4 previously mentioned, slowly running a stand gave a pressure fluctuation of only 40 psi at 8,000 feet. Slowly spudding with the pump on gave a surge of pressure of less than 50 psi in almost every case. Rapid running of a stand of pipe was at the normal rate of going in the hole of about 15 seconds per stand. Slow dropping of a stand was at the rate of 33 to 41 seconds for 90 feet of drill pipe. Rapid spudding with the pump on was five to seven seconds for 35 feet of pipe. Slow spudding was normally from 22 to 41 seconds for the same length of pipe.

Figure 8 shows the effect of opening the pump rapidly on pressure surges. At 8,000 feet, putting the pump on rapidly resulted in a pressure surge of 300 psi, whereas only a 150 psi increase in pressure occurred on opening the pump slowly.

The foregoing data has been given in much greater detail in a paper entitled *"Down-the-Hole Pressure Surges and their Effect on Loss of Circulation."* This paper was presented by W. C. Goins, a member of the study group, at the Spring Meeting of the Southwestern district, A.P.I. The material gathered in this study led to a program of controlled rate of pipe movement on the J. F. Perry et al Unit No. 1 Well at Peach Point, and Mermentau Mineral and Land Company, Inc. No. 2 Well at Little Chenier. The results of this program are described herein under the section on preventive measures.

3. *Excessive hydrostatic pressure:* Hydrostatic pressure is a major factor in loss of circulation, in that when hydrostatic pressure is great, only smali pressure increases may exceed formation strength and cause a loss. Ordinarily, little can be done about this as the mud density is seldom greater than that necessary to hold back formation pressures, plus a small safety factor.

4. *Inadequate annular clearance:* This factor may easily be one of the most influential in causing formation breakdown, since it governs, to a large extent, other factors causing excessive pressures, such as balling, spudding, and swabbing. It also influences annular circulating pressures.

In the upper portion of a deep hole the annular clearances while drilling is in progress are generally sufficient to prevent losses due to the causes listed above. However, as drilling progresses and protective strings of casing become necessary, annular clearances are reduced, with consequent increased pressure fluctuations on working the pipe. Also, annular circulating pressure becomes greater, making loss of circulation more likely to occur. It is a common field observation that greater difficulties are encountered in the so-called "slim hole drilling" where annular clearances are small.

Two methods were used by the study group to determine the point of loss:

1. *Radioactive tracer:* Briefly, the procedure used to determine point of loss by this method is to include a radioactive substance such as carnotite with the material squeezed into the formation to seal off a loss. Then a gamma ray survey is made to find the point of penetration of the squeeze material. This method has been used a few times with only fair success.

2. *Spinner survey:* The most reliable found so far to determine the point of loss has been the spinner survey. The method involves the use of an instrument having a delicately mounted spindle with rotor blades which rotate in a moving fluid, making and breaking an electrical circuit. The spinner is run on a wire line. When the well is closed in and mud is pumped into the formation, the point or points of entry can be located. However, the spinner may become clogged with sealing agents or formation fragments in the mud and it is not entirely reliable for this reason. The spinner survey has been successful in 25 out of a total of 44 attempts. Of the 19 unsuccessful runs, seven failed due to hole bridging, a condition not attributable to the instrument itself, so the spinner survey was actually successful in 25 out of 37 runs, for about 67 percent overall success.

At the present time attempts are being made to develop another method for finding points of loss which will not have the disadvantages of previous methods.

Five different remedial methods have been tried thus far:

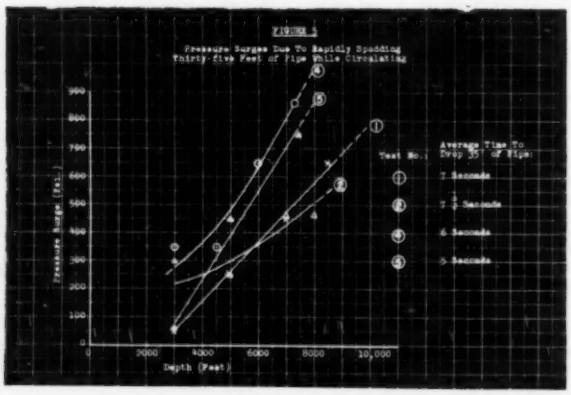
1. *Sealing agents:* This covers use of materials such as cellophane strips, mica, wood fibers, cottonseed hulls, ground plastic, etc. These materials are introduced into the drilling fluid, either prior to or after loss, with the idea that mud entering the formation will carry its own plugging agents. This method is well known and has had varying degrees of success. In initial cases of loss, it is usually best to try sealing agents first, especially if the loss is not too severe, since it is generally the most economical procedure. However, there are many losses where sealing materials fail to seal and other methods become necessary.

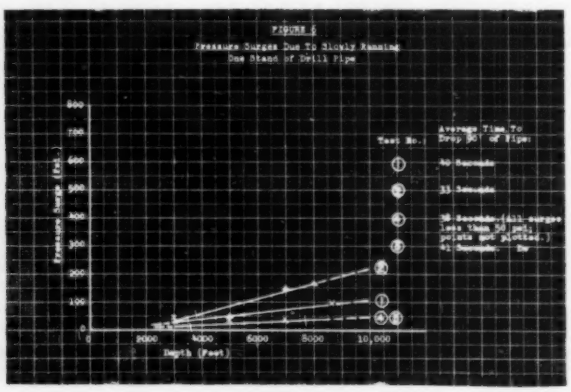
2. *Cement squeeze:* This method is also well known. In cases of severe loss it has probably been used more than any other method. It has the advantage of being able to effect a more permanent seal, if successful, than sealing agents. However, it also has a number of disadvantages. If a cement squeeze is made in a long open hole section, there is considerable danger of sidetracking the hole after a squeeze. Also, there is a good chance of sticking the drill pipe at some later time due to the cement sloughing into the open hole.

3. *Ground plastic squeeze:* This method has been tried only a few times by the study group and then with only fair success. It consists of squeezing a bentonite or clay suspension containing ground plastic into the formation. Howard and Scott[3] found that a granular material such as ground plastic will seal larger cracks in the formation better than any other material. Therefore, the ground plastic squeeze may be worthy of further testing.

4. *Silicate squeeze:* In this type of seal, liquid sodium silicate is squeezed into the formation together with a high solids-fresh water base mud which is loaded with sealing material. These are mixed below the bit in the ratio of 1 bbl. silicate to about 15 bbls. of water mud. This mixing is accomplished either by pumping one material down the drill pipe and the other through the annulus, or pumping slugs of both materials down the drill pipe, using a water spacer between the two.

The silicate squeeze has given very good results in sealing off a considerable number of losses. This method has been used




Pressure Surges Due To Slowly Running One Stand of Drill Pipe
Pressure Surge (Psi.)
Depth (Feet)
Test No.
Average Time To Drop 90' of Pipe:
40 Seconds
33 Seconds

on the Gulf Coast for several years now.

5. *Diesel oil-Bentonite squeeze:* This method of remedial procedure has been developed by the study group only recently. Two field trials have been made to date and both have been very successful. This method involves suspending a very high concentration (about 300 lbs/bbl.) of bentonite in diesel oil. A small amount of sealing material may also be included. The suspension is squeezed into the formation, together with mud in the hole which is displaced down the annulus. The squeeze ratio is roughly one barrel of mud to four barrels of diesel oil and bentonite. The resulting mixture becomes very viscous as the bentonite extracts the water from the mud, and it continues to grow in strength as it is displaced into the formation under pressure and comes in contact with more mud. The diesel oil is squeezed out under pressure, leaving the solid, partially hydrated bentonite behind. Any additional filtrate or mud entering the mixture will cause further swelling and hardening. This method is both quicker and cheaper than the silicate type squeeze. The necessary steps are being taken to preserve Gulf's patent rights in this process.

It is doubtful that methods could ever be developed which would completely eliminate loss of circulation. However, certain measures may be taken to lessen the likelihood of loss. Some of the most important points to consider are:

1. *Increased annular clearances:* While drilling the S. S. Perry No. 2 well there was a total of 22 separate losses, all occurring in the 6 ⅛-inch hole below the 7-inch casing. Twenty-one of these losses occurred while using 3½-inch drill pipe and internal flush tool joints with rubber casing protectors. Only one loss was experienced after the pipe was exchanged for 3½-inch pipe with double streamline, external-internal upset tool joints. Using the latter pipe, 735 feet of hole was drilled as compared to 367 feet made with the former. There was a very sound basis for expecting improvement. The increased annular clearances gained by using the streamline tool joints made balling less likely, and there was less chance for a pressure build up due to piston action on working the pipe. Also, a lower mud weight was made possible by the decreased swabbing action of the new pipe.

2. *Reduction of balling:* Based on a comparison of the wells drilled at Peach Point where balling proved to be extremely troublesome, there appear to be several effective methods for combatting this condition. Using a combination of these methods, balling was eliminated altogether on the J. F. Perry et al Unit No. 1 well.

First, the use of oil emulsion mud seemed to help considerably. Second, the substitution of drill pipe with streamlined tool joints in the small hole below the 7-inch casing was of benefit. Third, maintaining a uniform, fairly slow drilling rate, and holding the length of time on bottom to a maximum of 24 hours proved to be very worthwhile. Although balling is not so troublesome in the Little Chenier Field, the same precautions were taken and no balling occurred while drilling.

3. *Control of pressure surges:* As previously illustrated, reduction of momentary pressure increases is very important. Using the data gathered by the study group, a controlled rate of pipe movement was put into effect on the last well drilled in both the Peach Point and Little Chenier fields. Apparently this program was very effective, since no loss occurred on the J. F. Perry et al Unit No. 1 well, and no appreciable loss was encountered at Little Chenier after the program was started. The following schedule was used on the two wells:

(a) When going in the hole with drill pipe, rate of lowering each stand was held to 35 to 40 seconds after reaching a depth of 3,000 to 4,000 feet.

(b) The kelley was worked very slowly at all times, especially while circulating.

(c) The pump was always opened slowly, and never put on while lowering the kelley.

The success of pressure surge control and elimination of balling is reflected in the saving of $75,000 for mud and chemical costs on the J. F. Perry et al Unit No. 1 well, as compared to the average cost of these materials for the other three wells in the Peach Point field to an equivalent depth. In addition, approximately 38 days in rig time were saved while drilling and coring from the 9⅝-inch casing point to total depth of 11,560 feet, which was taken as the comparison point.

SUMMARY

Based on the work done by the study group to date, the use of a controlled rate of pipe movement appears to be the best method of preventing losses. Such a program seems particularly worthwhile in deep wells where heavy mud weights are used. The spinner survey has been a very useful means of determining the point of loss, but it is susceptible to clogging. A more efficient method is being developed at the present time.

Although the diesel oil-bentonite squeeze has had very little trial under field conditions to date, it appears to have great promise for future application as a remedial procedure for loss of circulation. The silicate squeeze has been of value in many instances of loss in the past.

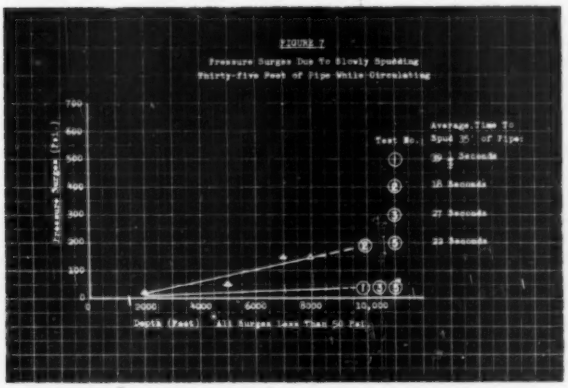
It is hoped that the methods outlined in this paper will receive more extensive trial and prove of benefit in combatting lost circulation.

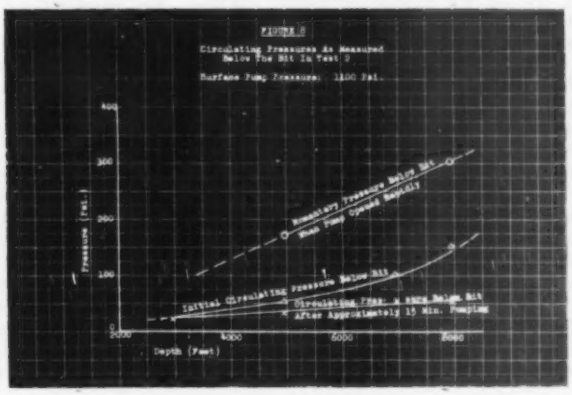
REFERENCES

(1.) "Changes in Hydrostatic Pressure Due to Withdrawing Drill Pipe From the Hole." *Drilling & Production Practice*, API, 1934.

(2.) "Wall Collapse in Oil Wells as a Result of Rock Stresses." *World Oil*, July 1, 1949.

(3.) "An Analysis and the Control of Lost Circulation." Paper presented at the St. Louis, Missouri meeting of the Petroleum Branch, A.I.M.M.E., February 19-21, 1951.





RECENT TRENDS IN SOUTH AMERICAN OIL POLICIES

By Dr. J. E. Rassmuss

Petroleum Consultant, Lima, Peru

SOUTH AMERICA'S OIL PRODUCTION, including Trinidad, amounted in 1951 to about two million barrels daily or 17 percent of the world's output, and its exports were 1.6 million barrels daily, exceeding slightly those of the Middle East. South America's oil resources represent the most important reserves for the Western Hemisphere and stand as the most reliable bulwark for hemispheric defense in view of political uncertainties prevailing in the Middle East.

Of North American countries, Mexico's exports in 1951 dropped to 15 percent of its production, amounting only to about 32,000 b/d, while Canada's fast increasing production yielded only about 32 percent of that country's consumption. But political restrictions in many South American countries delay their faster development.

In Argentina, oil production, limited practically to the state controlled YPF, has remained almost stagnant for many years. A decade ago, in 1941, production reached almost 22 million barrels yearly, an output which has been surpassed only slightly since that time. During the war, in 1943, a high of 27.7 million barrels was attained, decreasing to about 20 million barrels in 1946 and remaining in subsequent years at 22-23 million barrels. In 1951, production increased 10 percent to 25,725,000 barrels, remaining at about 70,000 b/d in the early months of the current year. In the extreme north, in the province of Salta near the Bolivian frontier, high yielding wells of 1,000 b/d and more have been found in the past year, but their exploitation is hampered by the difficulties of transport. The distance by railway to Buenos Aires is more than 1,000 miles. Only by the construction of a new pipeline of about 600 miles length to the port of Rosario on the Parana river could this problem be solved satisfactorily.

In the far south, in Tierra del Fuego, three wells south of Bahia San Sebastian have yielded gas and only one well about 60 barrels of oil. The beds of the Chilean Magellan basin thin out to the eastward, the region belonging to Argentina.

The region south of the Santa Cruz massiv is considered as the most promising prospect at present, but there are no indications that any important changes can be expected in the near future and Argentina's rapidly growing government-favored national industry requires continuously increasing imports. In 1951 consumption amounted to about 68 million barrels, of which less than 40 percent was supplied by domestic production, and at the beginning of this year imports increased to 115,000 b/d.

Centralization of oil developments in the bureaucratic organization of the government - administrated YPF, subject to political influences, lacks the flexibility of individual initiative, so indispensable in the oil industry. Production of the still existing private companies is decreasing because of the depletion of their fields, and the Ultramar Co., owned by Socony Vacuum and The Texas Company, found the situation so unencouraging that it sold its refinery to the government.

Brazil, which is the largest consumer of oil in South America after Argentina with more than 100,000 b/d and increasing about 20 percent yearly, has recently confirmed its strongly nationalistic policy. President Vargas submitted to Congress a new law authorizing the constitution of a national petroleum enterprise, called PETROBRAS, with a capital of 10,000 million cruzeiros (about 550 million dollars), to be controlled and managed by the government, which will hold 51 percent of the shares. The sum of 4,000 million cruzeiros is to be contributed by the government, but principally by assigning its existing installations in fields and refineries, and not in cash. The balance of 6,000 million cruzeiros is to be raised by new taxes and by private subscription, excluding foreign capital. Realization of the project and providing the necessary funds at an early date appears difficult.

While the law establishing a complete state monopoly, except for refineries already established, was approved by the Brazilian Congress on September 3, and the nationalistic policy seems firmly established, some influential journalists like Assis Chateaubriand have strongly criticized the course adopted by the government and Deputy Raimondo Padila termed the enactment of the law a Communist victory.

Oil production from the only producing field at Bahia was more than doubled in 1951 to 690,000 barrels and is reported at about 2,500 b/d, but remains insignificant in comparison with the demands of the country. The search for new fields has been unsuccessful so far. Two wells on Marajo island in the state of Para, the first at Limoneira reaching a depth of 13,-200 feet, remained dry, and a third is being drilled. In the Piauhy - Maranhao basin the first well at Carolina proved dry; a second is projected. Eleven new tankers have been ordered by the government in different European shipyards and the ambitious refinery program with the big refinery at Cubatao and other projected refineries in Rio, Niteroy, Sao Paulo and Manaos anticipates refining capacity for all the country's needs.

In Chile the law creating the Empresa Nacional de Petroleo establishes as the "absolute, inalienable and imprescriptible" property of the State all oil deposits in the country, and this enterprise is appointed to make the country independent of foreign oil. Remarkable progress has been achieved. Fifty-seven wells had been drilled up to the end of 1951, of which 31 were producing oil and 15 gas, and total yield in 1951 was 759,000 barrels. Until the end of 1953, when the refinery at Concon is to start with a throughput of 15 million barrels, it is yearly planned that one-third or 5 million barrels shall be supplied by domestic production. At present the domestic demand is still entirely provided by foreign imports, principally of Peruvian products, being the output of Magellanes exported to Uruguay for earning dollars. About 1,200 million pesos ($40 million U. S.) have been spent up to 1951 by the government in oil development.

Bolivian production decreased in 1951 to 529,000 barrels through the decline of the Camiri and Sanandita fields, the former yielding about 50 percent of the total Bolivian production. Development of the new Monos field north of Sanandita is projected for this year as is pipeline construction from Camiri to Yacuiba on the Argentine border to facilitate shipments to the neighboring Argentine market. Bolivia has opened the northern provinces of the Beni region, which are of difficult accessibility, to foreign capital in mixed companies, but no negotiation is reported so far. A Texas group of independent oil companies is reported to have applied to the former government for a concession of 210,000 acres in the southern fields with the intention of building a 12-inch pipeline to Asuncion, Paraguay, 385 miles long at a cost of 26-29 million dollars and invest a total expenditure of 40 million, but no confirmation has been reported. In spite of the considerable reserves of the Bolivian fields, the country is still obliged to import about 5,000 b/d at an estimated cost of 13 million dollars yearly.

By the last revolution and the taking over of power by the new government which declared as one of its principal objectives the nationalization of the mining industry, the outlook for participation by private enterprise in Bolivian development and early utilization of its oil resources seems improbable.

An impressive picture of the enormous progress of free competitive private industry was provided by the National Pe-

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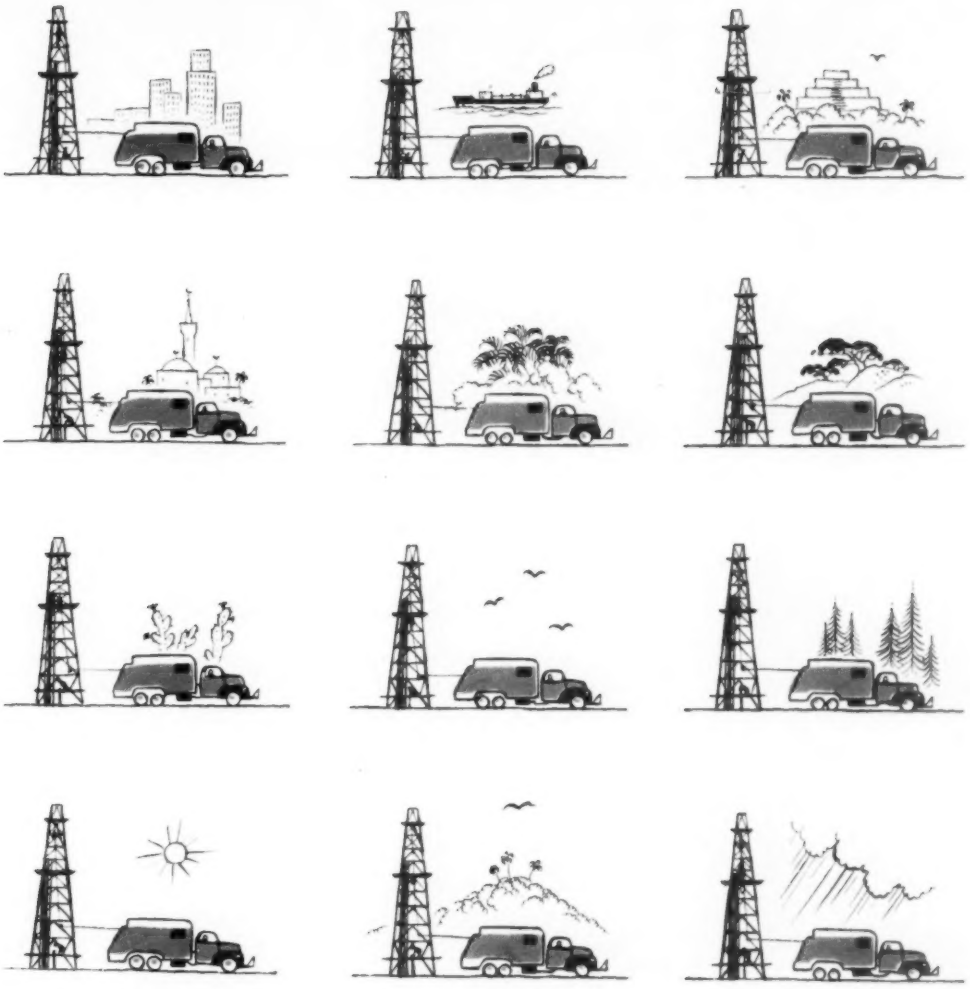

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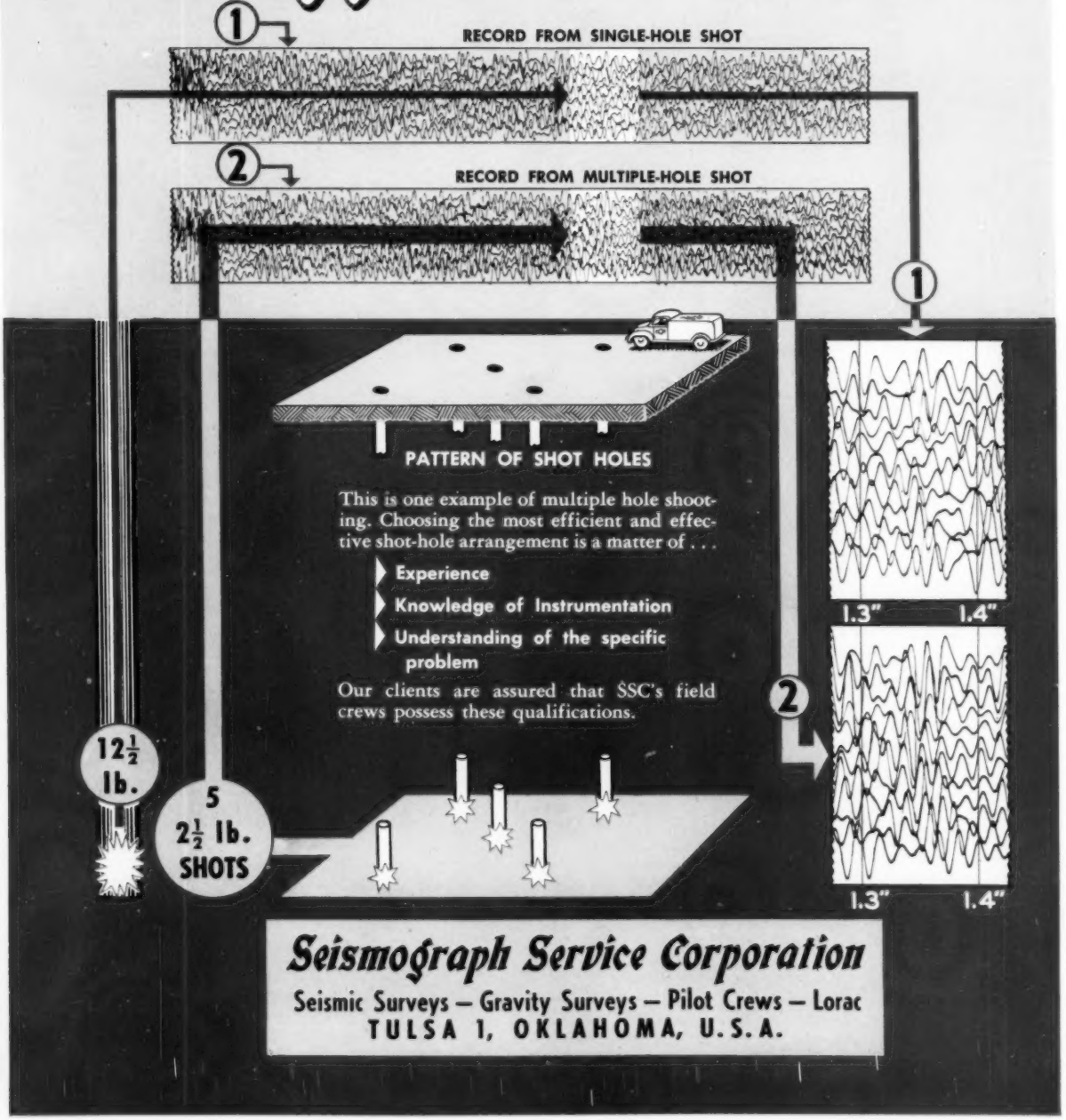

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Taxation reform sought to increase Italian consumption

By PROF. SAVERIO ILARDI

REPORTS PRESENTED at the latest meeting of Unione Petrolifera Italiana provided an analysis of the progress of the Italian petroleum industry in 1951 and the trend of consumption. Highlights are the notable growth in the industrial field, the continuing enlargement of refining capacity resulting in increased output, the improvement in the services of distribution and the expansion of foreign trade.

Importations of crude processed in Italian refineries and destined for the home market were 32.47 per cent larger in 1951 than in the year preceding. Including crude processed in transit, Italian refineries worked up approximately 7,400,000 tons in 1951. The annual processing capacity of the country, which stood at 7,000,000 tons at the commencement of the year, had risen to about 9,500,000 tons by January 1, 1952. Thus, although consumption of oil products showed an increase of nearly 25 percent in 1951 and exports expanded appreciably, the combined domestic and export markets absorbed less than the national refiners could have produced had more complete and more economical use been made of their capacity. This condition naturally has exerted a negative influence on the market as the presence of a continuing surplus is definitely a bearish factor. The remedy, in the view of the UPI, is to be found only in an increase of domestic consumption and greater activity in export.

Imports of crude oil and residuals for processing during 1951 amounted to 5,555,100 tons, an increase of 1,619,147 tons or 41 percent over the year preceding. Among finished products imported were 521,205 tons of fuel oil, a decrease of 70,807 tons from 1950, due to enlarged refinery output. For the same reason, imports of lubricating oils declined. On the other hand, receipts of aviation gasoline at 27,477 tons showed an increase of 19.10 percent. Imports of paraffin were 15,000 tons, about the same as in 1950, and imports of liquefied petroleum gas were 25,000 tons. Receipts of the two last named products are declining in 1952, owing to the larger output of domestic refineries.

Italian refineries in 1951 treated 5,252,234 tons of crude, a gain of 1,287,546 tons over 1950. Output of finished products amounted to 4,868,862 tons against 3,650,014 tons in 1950, an increase of 33.39 percent. To the volume of crude refined in 1951 must be added 2,122,228 tons brought in for processing in transit. Finished products derived from this crude totaled 2,079,032 tons and hence the total quantity of products reached 6,947,894 tons. Of this, 4,960,644 tons, or 71.40 percent, went to the internal market and 1,987,250 tons, 28.60 percent, were exported. Details of output and distribution of products are shown in Table I.

TABLE I

Products	Production Put on the Internal Market	Export of Products obtained by refining in Transit	Export of Products derived from national Crude Oil
Gasoline	799,700	429,107	118,239
Kerosine	251,048	193,512	21,620
Gas Oil	944,252	400,281	55,415
Fuel Oil	2,625,945	750,262	5,403
Lubricants	86,101	580	2,384
Benzine Solvent	7,582	———	———
Special Distillate	10,863	———	1,794
Bitumen	194,850	8,653	———
Liquefied Gases	34,988	———	———
Paraffin	515	———	———
Tar	105	———	———
Coke	4,695	———	———
	4,960,644	1,782,395	204,855

TABLE II

Products	1950	1951	Percentage Increase
Aviation Gasoline	28,000	30,000	7.14%
Motor Gasoline	655,000	780,000	19.08%
Kerosine	185,000	200,000	8.10%
Gas Oil	725,000	900,000	24.13%
Fuel Oil	2,300,000	2,930,000	27.39%
Lubricants	120,000	127,000	5.83%
Bitumens	150,000	190,000	26.66%
Solvents	18,000	20,000	11.11%
Paraffin	20,000	20,000	———
Liquefied Petroleum Gas, Greases	30,000	60,000	100.00%
	4,231,000	5,257,000	24.24%

TABLE III

Country	Gasoline Sales Price Lire/ Liter	Taxes Lire/ Liter	Taxes % of Sales Price	Number of inhabitants per Automobile
Ireland	58.40	25.70	44.00%	29
Holland	60.70	31.15	51.30%	45
Belgium	67.50	34.50	51.10%	21
England	68.60	36.50	53.20%	15
Sweden	68.80	30.00	43.60%	20
Denmark	72.90	36.90	50.60%	24
Norway	81.00	48.00	59.25%	28
Switzerland	90.10	43.00	47.70%	24
France	95.05	55.25	58.10%	17
West Germany	102.00	61.00	59.80%	49
Spain	120.00	88.00	73.30%	179
Italy	128.00	86.20	67.35%	81

The report emphasizes the fact that the refineries of Italy are now equipped to turn out petroleum derivatives of high quality. The gasoline produced in 1951 reached octanes of 70-72 (motor method) with premium gasoline at 79 o.n. (motor method). Several plants are able to produce oils of high viscosity indices and others will be prepared to do this by next year.

On the subject of distribution, the report, after noting the abolition of the marketing quotas imposed by the Ministry of Industry, discusses the heavy volume of supplies and the intense competition that prevails and directs attention to the diversion of supplies to industries that enjoy special fiscal advantages, such as agriculture and fisheries.

While the growth in consumption of oil products in Italy to 5,257,000 tons in 1951, exclusive of bunkering, a rise of 1,026,000 or 24.24 percent, shows a substantial increase, it is pointed out that it is still too low. In comparison with other parts of Western Europe, not to mention such countries as the United States, Canada, Australia, New Zealand, and South Africa, it is obvious that Italy lags far behind. Table II gives the consumption of principal products with the percentage of increase in 1951 over 1950.

Responsibility for the low average of individual consumption in Italy, particularly of automotive fuels, must be assigned largely to the extremely heavy taxation imposed. Out of a price of 128 lire paid for a liter of gasoline, 86.20 lire or 67.35 percent is taken by the Italian tax gatherers; out of a price of 110 lire for a liter of kerosine, and a price of 81 lire for a liter of gas oil, the government takes 46.83 (57.81 percent) and 73.57 lire (66.88 percent) respectively. These exactions appear onerous compared with those levied in other European countries. (See Table III.)

From the data in this table it can be seen that: (a) due to high taxes, Italy has the highest sales price for gasoline, more than double what it is in Holland and Ireland, a little less than double that in Belgium, England and Sweden, and more than 40 percent greater than in Norway, France and Switzerland; (b) in Italy the tax on gasoline, in absolute figures, is enormously different from that in all the other countries except Spain (about three times greater than the Irish, Swedish, Dutch, and Belgian

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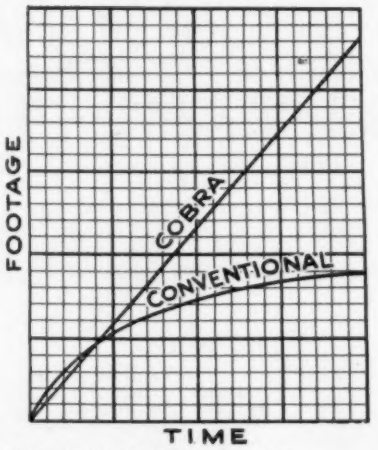
CRUSH-TYPE BIT DEVELOPED FOR BRITTLE FORMATIONS

By E. G. Boice*

A CRUSH-TYPE HARD FORMATION BIT known as the "Cobra" has been developed by the Reed Roller Bit Co. for drilling extremely hard and brittle formations. The "Cobra" is a special purpose bit in the strictest sense of the word. Basically, the "Cobra" uses the same bearings and cross roller design as other hard formation Reed bits. Instead of conventional teeth on the cutters, however, it has a series of tungsten carbide inserts imbedded in smooth rollers. The contact surfaces of these inserts are spherical in shape, which gives the bit an unconventional appearance.

In West Texas chert formations (30 percent chert content or better) the "Cobra" bit was found on field test to drill from four to eight times the footage of conventional hard formation bits. In laboratory tests on still harder formations such as pink quartzite (compressive strength from 50,000 to 60,000 pounds per square inch) it was found that the bit would drill 15 to 20 times as much footage as conventional bits.

Rate of penetration was about three to four feet per hour in West Texas chert formations with the drilling rate falling off in softer formations. The rate of penetration in the same formation remains substantially constant throughout the life of the bit. Since rate of penetration does not fall off with bit wear, some form of torque indicator is needed to tell when the cutter bearings are becoming worn. The bit should be pulled whenever the torque rises appreciably.



Difference in the drilling characteristics of the "Cobra" bit compared to conventional hard formation bits.

Field experience with bits in the 8¾-inch size range indicates that weights of 25,000 to 35,000 pounds are adequate. This is somewhat less than the weights required for conventional bits. Relatively slow rotary speeds of 30 to 50 rpm seem to give best results. It is believed that slow rotary speeds give the fluid time to clean the bottom of the hole, thus avoiding re-cycling of cuttings.

* Director of Research, Reed Roller Bit Co., Houston, Texas.

Best results and longest runs have resulted when bottom hole circulation, such as that obtained with "Twin-Blast" slush nozzles, is used. In this connection it is important to pump enough fluid to maintain the high nozzle and return annulus velocities required to keep the bottom of the hole free from cuttings.

Tests have indicated that penetration characteristics of this bit are the reverse of those found when running conventional bits. The harder the formation, the faster it drills. Unless a geologist is warned, he may erroneously conclude that the bit is striking a softer formation when actually it has encountered a harder, more brittle one.

It is too early to draw any firm conclusion regarding the economics of running "Cobra" bits, but tests indicate that where thick streaks of hard, brittle formation are encountered, there is a substantial economy in round trips and drilling time.

It is believed that bit costs per foot will be comparable to conventional bits in spite of the high first cost of the "Cobra" bit, since each bit gives so much more footage. Many round trips and much rig time are saved, thus effecting an overall economy in drilling costs.

It is impossible to foresee what the development of the "Cobra" will eventually mean to the drilling industry, but it is evident that a means has been provided for more economical penetration of known hard formations. The bit may also make possible the exploration and production of pay zones heretofore considered uneconomical to develop.

A "Twin-Blast" slush nozzle incorporated in the "Cobra" bit directs mud circulation to the bottom of the hole.

Bit running on one of the laboratory drilling machines, drilling in granite.

Worn bit showing uniform wear on the cutters.

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Unsolved oil problems discussed at meeting of chemists

IGNORANCE was displayed at the September meeting of the Petroleum Division of the American Chemical Society at Atlantic City. One entire day of the meeting was given to an inventory of unknowns and a discussion of the unsolved problems of the oil industry.

In starting the symposium, J. Bennett Hill of Sun Oil Co. confessed that chemists still do not know too much about what petroleum is. He suggested that in the next 10 years a good many answers may be forthcoming, such as the structure of the typical molecule of lubricating oil and some of the complex sulfur, nitrogen and oxygen compounds. Once the nature of these molecules is known, the refiner will be better able to handle them effectively.

Morris Muskat of Gulf Oil Corp. told the chemists that the production engineers do not know all the answers either. They are unable to produce 100 percent of the oil in a given field by physical means. In his review of present methods, he told what the chemists have contributed thus far to secondary production and suggested the economic gains possible by increasing recoveries from present fields. As of the first of 1952, the oil industry in the United States had produced 43 billion barrels and had 27.5 billion barrels of reserves, a total discovery to date of 70 billion barrels of producible oil. Mr. Muskat said that in present known fields, another 70 billion barrels of oil is in the formation waiting for improvements in production methods. Assuming that it costs one dollar to discover a barrel of oil, there is a prize of $70 billion to be won by 100 percent oil recovery. Each one percent increase in recovery based on original oil content is worth $1.4 billion.

Mr. Muskat said that the basic reason for failure currently to effect 100 percent recovery rests on two simple physicochemical phenomena: fluid immiscibility and interfacial forces.

In water-drive, field recoveries may be as high as 60 to 80 percent under favorable conditions, but the tremendous internal surfaces of porous rocks create forces of great magnitude to prevent more generous recoveries. Completeness of displacement by water is limited by the immiscibility of the displacing and displaced phases.

Mr. Muskat reviewed a number of approaches which are being made to the problem. He discussed the efforts being made to vaporize oil in the rock by restoring dry gas to the formation under very high pressure and then following cycling procedures. He told of the idea of using butane and propane as liquids mixible with crude, but suggested that the necessary investment in light products would be very great. Although wetting agents have been tried, Mr. Muskat said that there is no conclusive evidence of effectiveness. A more effective approach may be, he thinks, in the modification of interfacial forces by additives. The need is for additives which will give vanishing interfacial tension and yet not be adsorbed on solid surfaces. The job of attaining 100 percent oil recovery is one for the chemists, Mr. Muskat inferred.

In another part of the program, the future of catalysis in the petroleum industry was assessed by E. V. Murphree of Standard Oil Development Co., while Dr. Hugh S. Taylor of Princeton University discussed the future of catalysis in hydrocarbon chemistry. In this field he suggested that more information is needed about solid state behavior and its correlation with catalytic activity.

Mr. Murphree agreed that more should be known about the mechanism of various catalytic reactions so that development of new processes will be expedited and present processes improved. In view of the financial stake in process improvement, Mr. Murphree thinks that progress will be steady.

Catalytic reforming methods will be improved greatly in the future by the use of more selective catalysts and in the development of cheaper methods of application. One need, as Mr. Murphree sees it, is for the discovery of catalysts which will be effective in giving a substantial conversion of paraffinic compounds to aromatics. The process may require lower pressures or higher temperatures.

A large increase in catalytic reforming by methods such as hydroforming would produce very large quantities of by-product hydrogen. Processing a million barrels of naphtha daily would produce 700 million cubic feet of hydrogen daily. Mr. Murphree suggested some of the uses to which this hydrogen might be put in petrochemical operation, hydrofining and hydrogenation. Treatment of sour crudes by hydrogenation was reported to be an ideal method of surfur removal.

Hydrogenation was investigated some years ago as a method of producing light products from heavy residua. The process was not economic at that time, but Mr. Murphree told the chemists that it may become more commercial in the future. Catalysis may be brought into play to improve the process.

Methods of supplementing normal petroleum products from synthetics and from shale came in for some attention. H. H. Storch of the U. S. Bureau of Mines reviewed the application of catalysis to synthetic fuel production and L. C. Kemp, Jr., and H. V. Atwell reviewed the present state of the art in shale oil recovery and suggested the direction which development might take.

The oil refinery of the future was pictured by Paul F. Swanson and Nelson R. Adams of the M. W. Kellogg Co. as being larger, more complex and better integrated. Synthetic and petrochemical operations will be combined with basic refining processes, they said.

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OIL ACTIVITY MOUNTS RAPIDLY IN WESTERN CANADA

BY DON TYRELL

VANCOUVER, B. C.

OIL COMPANIES in the Vancouver area are pushing additions to refinery capacity at their plants on Burrard Inlet to be ready for the coming of the Trans Mountain pipeline to the coast in the fall of 1953. Work on the line is progressing rapidly and late reports are that completion may be expected earlier than had at first been anticipated.

Shell Oil Co. of Canada has let contracts to the Fluor Corporation for a $10 million addition to its present plant at Shellburne on the south side of Burrard Inlet. Imperial Oil has arranged to spend $13,500,000 on its Ioco plant, and British American Oil Co. has purchased 300 acres on the inlet at Port Moody for a $10 million refinery.

Standard Oil of British Columbia is planning an addition to its Stanovan plant, but has made no announcement as to size and cost.

Payroll at the Shell plant will be increased 50 percent by the new addition which will raise petroleum industry spending in Burnaby municipality to more than $50 million in plants to be completed by the time the pipeline arrives at the Burrard Inlet shore. Shell holds a substantial interest in the $82 million line which will bring crude oil from Edmonton, Alberta, to replace the California crude now used in British Columbia refineries.

An additional 84 acres adjoining the Shellburne plant has been bought to make room for the extension of refinery facilities. This will bring Shell holdings up to 182 acres. The new program will enlarge refinery capacity to 15,000 barrels daily. Included is construction of a fluid catalytic cracking unit, a flasher, polymerization and treating unit and new office buildings. Shops will be built and tank storage for refined products increased to 300,000 bbls.

Work on the refinery is under way, with the Fluor Corporation planning to subcontract a large portion of the work to local contractors. The first Shellburne refinery was built on Burrard Inlet in 1932 with a capacity of 5,000 barrels. In 1949 Fluor Corporation built a $1,500,000 combination of cracking, treating, blending and polymerization units. Two years after the addition was completed, shell made a $500,000 addition to its topping plant.

Canadian Bechtel, contractor for the Imperial Oil addition to Ioco, has opened a local office to handle this program. Preliminary work is already under way on the site. Officials of Bechtel, which is also building the Trans-Mountain pipeline, have announced that the work season on the 800-mile line will be extended a full month this year which will bring completion in August, 1953, three months earlier than had been expected.

The most rugged 150-mile section has been completed, and the construction firms say they can work until stopped by shortage of pipe or by weather. Originally they had planned to work only until September.

Robert L. Bridges, president of Trans Mountain, has stated that pipe line deliveries will begin in Vancouver not later than October of next year. He adds that the initial tariff for transporting oil from Edmonton to Vancouver, based on present estimates of costs and a presently indicated initial throughput of approximately 75,000 b/d, will be 45 cents per barrel. The loading charge at the Vancouver marine terminal is expected to be 2½ cents per barrel for approximately half of the initial throughput which will be expected by tankers from Vancouver to California, the Pacific Northwest, or other offshore points.

In the meantime, developments are fast coming to a head in British Columbia's second pipeline, the proposed Westcoast Transmission natural gas line from the Peace River area of British Columbia and Alberta. Justice J. D. Kearney, head of the Board of Transport Commissioners in Ottawa, has indicated that the final decision on the charter will be made shortly.

Westcoast engineers have sent surveyors into the Pine Pass area for what the pipeline officials call "a detailed resurvey," to check up on the route the line should take between Pine Pass and Parsnip River and to re-survey, in greater detail, previously surveyed routes.

When permission is given, Westcoast wants to be ready to haul in equipment over frozen rivers and terrain so that work can go ahead regardless of weather. George Phillips, construction superintendent of Ford Bacon and Davis, Inc. of New York, engineers for Westcoast, and J. E. R. Wood and S. E. Huey of Wood and Huey, recently flew into the area to study the progress made. C. R. Sample of the New York firm's marketing division has been in Vancouver studying industrial and market uses of gas in the entire area to be served by the pipeline.

In the meantime, drilling in the Fort St. John area continues at a record rate with new successes extending the known reserves of the field. Pacific New British Dominion No. 1 blew in August 9, 13½ miles southeast of Fort St. John No. 1, the well where oil was first discovered in British Columbia last November. The new gas blow occurred in the Triassic formation. Gas flowed to the surface in 1½ minutes and tested 3,700,000 cubic feet daily with 15 to 20 feet of naphtha.

Another Pacific Petroleums well, Pacific Pete No. 15, has struck oil on the Wagner farm two miles east of the airport at Fort St. John and four miles off the Alaska Highway, getting 150 feet of 41 gravity green oil similar to that in the discovery well. It was hit in the mid-Triassic and followed a million cubic feet of wet gas.

This is the second gas strike at No. 15, being drilled by Commonwealth's No. 13 rig. It is the fifth oil strike in the immediate vicinity. Pacific Petroleums is setting pipe in two deep holes at the same time, bringing two gas wells into production, the former with 15,000,000 feet of wet gas and the latter with 10,000,000 in three zones and 1,350 feet of oil in the mid-Triassic.

Pacific Pete's No. 5 came into production with 3,500,000 cubic feet and drillers are now moving rig to Sunrise. Pacific Pete No. 9, one mile from the Alaska Highway, struck oil and 5,000,000 cubic feet of wet gas in the mid-Triassic.

A test well in the Line Mountain district of British Columbia has been spudded in by Stony Lake Oils at Stony Lake. Drilling equipment was moved into the location over a new road hacked through bush and muskeg to the site. The well is down on acreage obtained under a farmout from Del Rio Producers Ltd. Gas seepages in the area containing ethane, plus geological opinions advanced by Dr. G. S. Hume of the Department of Mines and W. Bickham, geologist for Wilrich Petroleums, one of the firms with acreage in the area, have encouraged the drilling program. George Richardson, president of Wilrich Petroleums, says that if oil is discovered in quantity, a $10 million pipe line will take it to tidewater. Such a line would emerge on the coast at Bella Coola and would allow a gravity flow from the 3,500 foot elevation of Stony Lake over an "easy to build" route.

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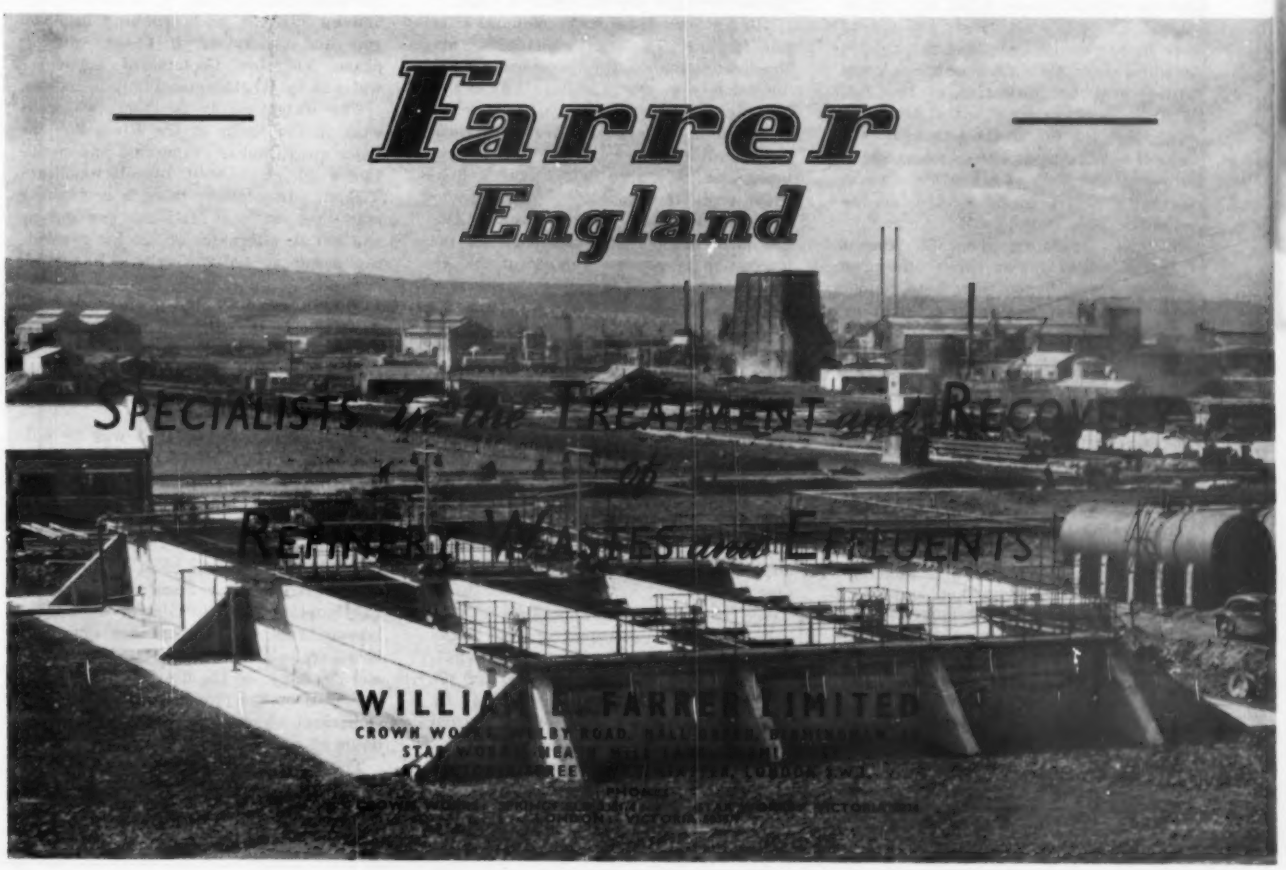

The first sea line about to be connected aboard a tanker at Banias Terminal, Syria. IPC photo.

Iraq's New Pipe Lines

(Continued from page 57)

The separators consist of 33′ x 7′ vertical cylindrical vessels fitted with spiral trays. The crude oil enters the top of these vessels tangentially and flows down the spiral trays, thus allowing a maximum surface area for liberation of the gas, which escapes through a central flume and is led from the top of the separators for disposal by burning as fuel or waste where necessary, the level of oil in the separators being controlled by a valve on the gas outlet line.

In these separators about 75 percent of the dissolved gas is taken off. The partly de-gassed crude then flows, under pressure sufficient to keep the remaining gas in solution, either direct to the stabilization plant or to storage in Hortonspheres, normally operated at 50 psi.

The gas separators were made by Head Wrightson Processes Ltd. to the company's own designs. Four of these degassing stations are at Baba Gurgur, two at Avaniah, and another is being erected at Mosul.

The stabilization plants are of conventional design. The crude from the Hortonspheres is pumped through heat exchangers counter-current with hot residuum, and then flashed at 340°F (171°C) into the first stage column. The bottoms from the first stage column are circulated through pipe stills to maintain the temperature at 450°F (232°C), this being the temperature at which it has been found necessary to maintain the column base in order to assure that all the dissolved sulfurated hydrogen is driven off. Overheads from column one pass to column two (second stage) where the condensible liquids are close fractionated, a condensate reflux being used, and the incondensible gas vented for fuel purposes in the power house and stabilization plant.

The bottoms from both columns, after passing through heat exchangers, are blended together as stabilized crude ready for delivery to the pipe lines. This stabilized crude contains about 90 percent of the butanes charged, representing some 75 percent of the original reservoir butanes and, as stated before, has a Reid vapor pressure of only four psi.

During the war, part of the stabilization plant was operated as a plant for the production of gasoline for use of the Allied Forces in Iraq and of a fuel residue to Admiralty specification which was delivered through the Tripoli line for use by the Navy.

In 1936, three stabilization plants were built and put into operation, but these have been added to subsequently, and now number eight with another in course of erection and due for completion in 1953.

The cooled crude oil for the stabilization plants flows by gravity to the tank farm situated at K1 pump station 1½ miles distant, where the oil is weighed for royalty assessment before delivery to the pipe lines.

Power Station at Kirkuk

Work on the equipment of this power station, which was commenced in 1947, was completed in 1951. There are six Clarke Chapman boilers, supplied by Spearing and Co., Ltd., each of 120,000 lbs. per hour evaporating capacity (economical capacity 105,000 lbs. per hour) generating steam at 415 psi and 750° F final temperature.

These boilers are fitted for using gas or fuel oil, and are built in the open with an umbrella roof to give sufficient weather protection. Power is generated by three turbo-alternators made by B.T.H., of 18,750 kw capacity each, running at 3,000 rpm and generating at 11,000 volts 3-phase 50-cycles. Cooling of condenser water is by Worthington-Simpson coolers.

The water supply is from two wells sunk in the banks of the River Zab, 20 miles away, and is evaporated and conditioned in plant built by Metropolitan-Vickers. In addition there is a stand-by house set with a National gas engine and B.T.H. alternator of 325 kw generating power at 400/230 volts, 3-phase 50-cycles.

This power station supplies power to the whole of the IPC and installations at Kirkuk, to K1 pumping station, and a portion is delivered to the town of Kirkuk, to which during 1951 it supplied 2.5 million kwh.

Total output during 1951 was 69 million kwh, an increase of over 20 millions over the 1950 total and four times as great as the 1947 total.

Special care has been taken over the design and layout of this plant to render it trouble-free, located as it is in an isolated district, away from vital supplies. On the other hand, in view of the advantageous fuel situation, it has not been necessary to strive for the maximum thermal efficiency, so the designers have concentrated on the provision of a simplified equipment which could be run with a minimum of unskilled staff.

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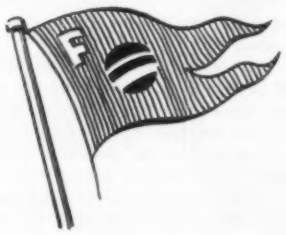

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Attack On Oil Companies

(Continued from page 45)

tribution to the objectives of the Marshall plan and to the restoration of Europe's economy, we should now be charged with wrongdoing on a theory so strained that it is impossible to understand without having seen the complaint."

Six companies attacked the validity of the order for submission of all past records and correspondence over the past 24 years as illegal and oppressive and cited the physical impossibility of producing all the papers demanded. Judge Kirkland of the Federal Court postponed hearings on these motions until after October 1 with the recommendation that the parties involved get together on agreement on what is to be submitted.

The other American companies accused have issued similar statements disavowing participation in or knowledge of any price-fixing or marketing control agreements such as are charged. The three European owned companies named in the complaint likewise have issued authoritative denials of the existence of an international oil cartel.

Along with the charges laid in Washington by the Justice Department, the Federal Trade Commission and the Senate Small Business Committee, the Attorney General has filed a civil suit in the U. S. District Court in New York City against four companies alleging unfair charges for oil supplied to the Economic Cooperative Administration and its successor, the Mutual Security Agency, for oil supplied as part of the foreign aid program. The companies named and the sums it is sought to recover are as follows: (1) a total of $31,795,619 from Standard Oil Co. (N. J.) and its subsidiary, Esso Export Corporation; (2) a total of $21,427,722 from Standard Oil Co. (Calif.) and The Texas Company, and their subsidiaries, Bahrein Petroleum Co., California-Texas Oil Co., Caltex Oceanic and Mid-East Crude Sales Co.; (3) a total of $14,118,498 from Socony-Vacuum Oil Co. and its subsidiary, Socony-Vacuum Overseas Supply Co.

This suit turns upon the basing point system of determining prices which has been under attack by the federal government in the case of other American industries. For many years the Gulf Coast, as the principal source of supply, has been the recognized basing point for petroleum prices both in the United States and abroad. In 1949, however, ECA representatives demanded a reduction in the delivered price of Middle East oil destined for Europe and the supplying companies agreed to two successive reductions. The government claims, however, that the rates charged remained higher than those charged on shipments to affiliated companies in the United States.

The defendants in the civil suit have issued denials of any departure from the rates agreed upon under the regulations issued by ECA, and the issue presumably will be fought out in a prolonged court proceeding. To those who are not involved in this particular action, chief concern is for the ultimate fate of the basing point system as affecting oil prices. The practice is defended as making possible world wide competition and it is asserted that its abolition would bring about chaotic conditions in world markets and would be particularly disastrous to the American oil industry.

Italian Taxation Reform

(Continued from page 65)

taxes, and more than twice as great as the English, Danish and Swiss taxes) and that in terms of percentage the tax on the sale prices in Italy is exceeded only by the tax in Spain; (c) as a direct consequence of this condition Italy has a smaller number of automobilists than any of the others (except Spain), there are only one-fifth as many as in England and France, one-third as many as in Denmark, Ireland, Norway, and Switzerland, and little more than half as many as in Germany and Holland, whereas, on account of the geographic configuration of its territory, Italy should be among those countries having the greatest proportionate number of automobile owners and drivers; (d) the situation in Italy as regards gas oil is analagous to that applying to gasoline. In Italy the tax burden on gas oil, and consequently its sale price, is higher than anywhere else (with the exception of England where gas oil is not used for automotive traction).

The report expresses a conviction that if the government would adopt a policy of reducing the tax burden on petroleum products there would be an appreciable increase in consumption and the yield from the oil taxes would increase because of the larger quantity of oil products consumed.

Besides that, an increase in the quantity of petroleum products consumed would react favorably on the automobile industry, on the transportation industry and other collateral lines of industry which would not fail to produce more revenue for the national treasury. There are some signs that the government, perhaps only gradually, will take some action in this direction. Near the end of the year the Minister of Finance, appearing before the Parliamentary Finance Committee, admitted that the tax burden on gasoline had reached the limit of supportability. Other recent official pronouncements raise hope that the tax on automotive fuels may be reduced.

Another depressing effect on the consumption of petroleum products is the high cost of automotive vehicles. This depends on various factors: the small output of the Italian automobile industry in proportion to its real capacity for production (number of workers in excess of real need, the high cost of licenses and accident insurance), and particularly the direct and indirect burdens that weigh on the whole automobile industry, even on the export division. There is urgent need for governmental action in this field to meet the needs of the industry.

Another factor that has an influence on the consumption of automotive fuel is the inadequacy and poor maintenance of the network of highways. However, there is a growing movement in favor of better roads from which improvement is to be expected. It is desirable that, as in other countries, the proceeds of automobile and gasoline taxes, or at least a major proportion thereof, should be spent on roads.

Another angle of the tax situation that figures largely in the cost of automotive fuel in Italy is the heavy business tax which the distributing agencies have to pay three months in advance. These prepayments are a permanent load on the distributing agencies, amounting to about 40 billion lire, on which interest of 3½ billion has to be paid. The amount of capital thus tied up is an increasing burden.

The Unione is making an effort to obtain a modification of the tax administration analogous to that in France, Germany, Denmark, and other countries which would allow a deferment of payment of taxes on petroleum products.

Another matter which the Unione has taken up with the Minister of Finance is the creation of a new (to Italy) class of taxable petroleum products, namely, light (very fluid) fuel oil. It is pointed out that in the U.S.A. and many European countries there is a notable consumption of fuel oil for domestic heating. The Unione wants this product to bear a mild tax so as to create a new market for this grade.

Encourage Regular Oil Changes

Educational publicity has been found effective by Liberty Petroleum Co. of Mt. Vernon, Ill., in inducing motorists to give more careful attention to lubrication of their cars and to change oil at frequent and regular dates. The company made a test by distributing through its stations reprints of an article from *Popular Mechanics* of April last entitled "When Should You Change Oil?" The article explained the need and functions of motor oil and recommended changes at 500-1,000 and 2,000-mile intervals depending on driving conditions.

Jerome Glassman, general manager of the Liberty company, said that after an 18-day test of distributing this information to local and transient motorists, a notable increase in oil changes and oil sales was observed which he attributed to the fact that the article given out dealt with the advantages of proper lubrication instead of confining itself to laudation of a particular brand of oil.

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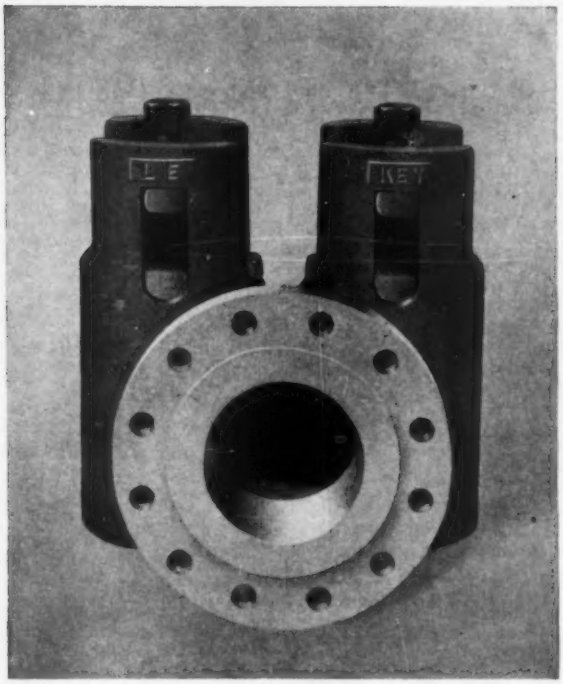

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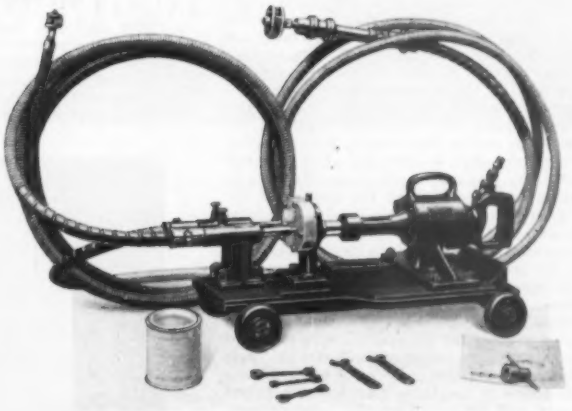

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BRITISH OIL NEWS

By E. Lawson Lomax

The question of premium grade motor spirit is one which is presently exercising the minds of British motorists and oil companies. Prior to World War II, the refining industry in the United Kingdom was small, relative to consumption, and practically all the motor spirit used in the country was imported as such. After the war the petroleum companies, backed by the government, embarked on a large expansion of the refining industry, the target for this expansion being fixed as a refining capacity of 20 million tons of crude oil per year.

This target has already been exceeded and the Petroleum Pool Board has for all practical purposes been dissolved. Yet, under government restrictions, the refiners of the country are still allowed to manufacture only motor spirit of the grade fixed by the Pool before its dissolution.

The companies' program for the expansion of the refining industry embodied the erection of a total of six catalytic cracking plants, of which two are in operation, two are due for operation in the later months of this year, and two will be completed and in operation during 1953.

This type of plant is a very expensive portion of a refinery, the crackers at present in operation having cost in the neighborhood of £16,000,000 (about $45 million). Three of the plants scheduled for operation, two this year and one next, will cost a total of £6,000,000, while the other one due for operation next year will cost another £2,000,000. Thus the oil companies have invested a total of £24,000,000 in these plants with the legitimate expectation that they will be able to get an adequate return on their investment.

In order to obtain this return, it is essential that the plants shall be operated at their maximum efficiency, not necessarily in the throughput, but rather technically as to the quality of the spirit produced. The higher quality products should command a higher sales price, whereas, under present conditions of maximum price control by the government, such efficient plant operation is impossible and therefore the return on investment is totally inadequate.

Catalytic cracking being the main modern recognized process for the manufacture of motor spirit of high octane rating and also for the basic manufacture of aviation gasoline, it would appear to be desirable to use these plants to the fullest advantage and thus render the country self-supporting in the production of aviation gasoline, the lack of such facilities being very marked during the recent refinery strike in the United States when civil aviation had to be curtailed owing to possible shortages in the supply of suitable fuel.

The effect of the low ceiling for motor fuels extends to the motor industry since the success of that industry depends on engine efficiency. Under present conditions, low compression engines are necessary for the home market, and manufacturers' efforts to increase efficiency of their engines by raising the compression ratio are heavily handicapped.

World Tanker Fleet

According to Davis & Newman Ltd., London, the world's tanker fleet (excluding vessels of under 500 tons gross register and U. S. government tonnage) increased by 1,250,000 deadweight tons between January 1 and July 1, the changes in registry being as follows:

Registered in	July 1, 1952	Jan. 1, 1952
U. S. A.	7,061,000	7,072,000
U. K.	7,057,000	6,831,000
Norway	4,617,000	4,407,000
Panama	2,936,000	2,822,000
France	1,266,000	1,201,000
Italy	1,125,000	1,043,000
Other Countries	6,702,000	6,115,000
	30,764,000	29,491,000

New tanker tonnage under construction or on order on July 1 was 13,692,000 dwt, with Norwegian and United Kingdom yards building over seven million tons or more than half the total.

Rotterdam (Pernis) Refinery

The proposed extensions to the Pernis refinery of the Royal Dutch/Shell group will make it the largest refinery in Europe with a throughput of nine million tons yearly.

The additional capacity will be derived from a new distillation unit of 3.25 million tons capacity on which construction work has already started. The present distillation capacity is 5.75 million tons of which 0.75 million tons comes from the Schoonebeek (Netherlands) oil field.

The extensions, estimated to cost £2,000,000, will mark a further phase of the post-war rehabilitation and new construction program which has already cost over £20,000,000.

At present the group has four refineries in the United Kingdom, three in France, two in Germany, and one each in Belgium and Italy, with an annual total crude oil processing capacity of over 20 million tons, making it the largest refinery operator in Europe.

First Prize for "Rig 20"

"Rig 20," the Anglo-Iranian Oil Company's graphic film record of the only serious oil well fire to occur during over 40 years of company operations in Iran, has won first prize for topical subjects in the documentary section of the Venice International Film Festival.

View of the 137-foot oil derrick at Arreton, Isle of Wight, where an exploratory well is to be drilled by the D'Arcy Exploration Company, Anglo-Iranian's prospecting subsidiary.

Personnel

The directors of Anglo-Iranian Oil Co. have announced the resignation from the board of James A. Jameson and Frederick G. C. Morris, and the appointment of John M. Pattinson and Harold E. Snow to fill the resulting vacancies.

Esso Transportation Co. announced the appointment of W. F. Wackrill, director and general manager, as managing director and of H. A. Wilson, assistant general manager, as a director.

Prior to joining Esso Transportation in 1946, Mr. Wackrill was with the Ministry of Shipping and the Ministry of War Transport.

Mr. Wilson joined Esso in 1923. He is a member of the Institute of Naval Architects, the Institute of Marine Engineers and the Institution of Engineers and Shipbuilders in Scotland. He is also a member of the Technical Committee of the Chamber of Shipbuilding.

Dr. J. T. Tyson has been appointed section head of the lubricants research section at Esso European Laboratories in succession to L. D. Derry, who died last June. Dr. Tyson is a graduate of London University and joined Esso Development Co. four years ago.

W. Lindsay Burns, chairman and managing director of the Balfour group of companies, recently returned from Canada and the United States, having completed arrangements for the formation of a new Canadian company, British & Dominion Process Engineering Ltd. He was accompanied by A. H. Rowles, managing director of W. S. Barron & Son, Ltd., of Gloucester. Under the aegis of the new company, which is jointly owned by British and Canadian interests, Balfour, Scott and Barron will extend their operations in Canada and the United States.

Aden Refinery Project

J. M. Pattinson, one of the managing directors of the Anglo-Iranian Oil Co., accompanied by C. E. Spearing, general manager of the refinery division, and other members of the company staff, has left for Aden to hold discussions with the governor and other members of the government on the company's plan to build a refinery of five million tons yearly capacity (about 100,000 b/d) in the colony.

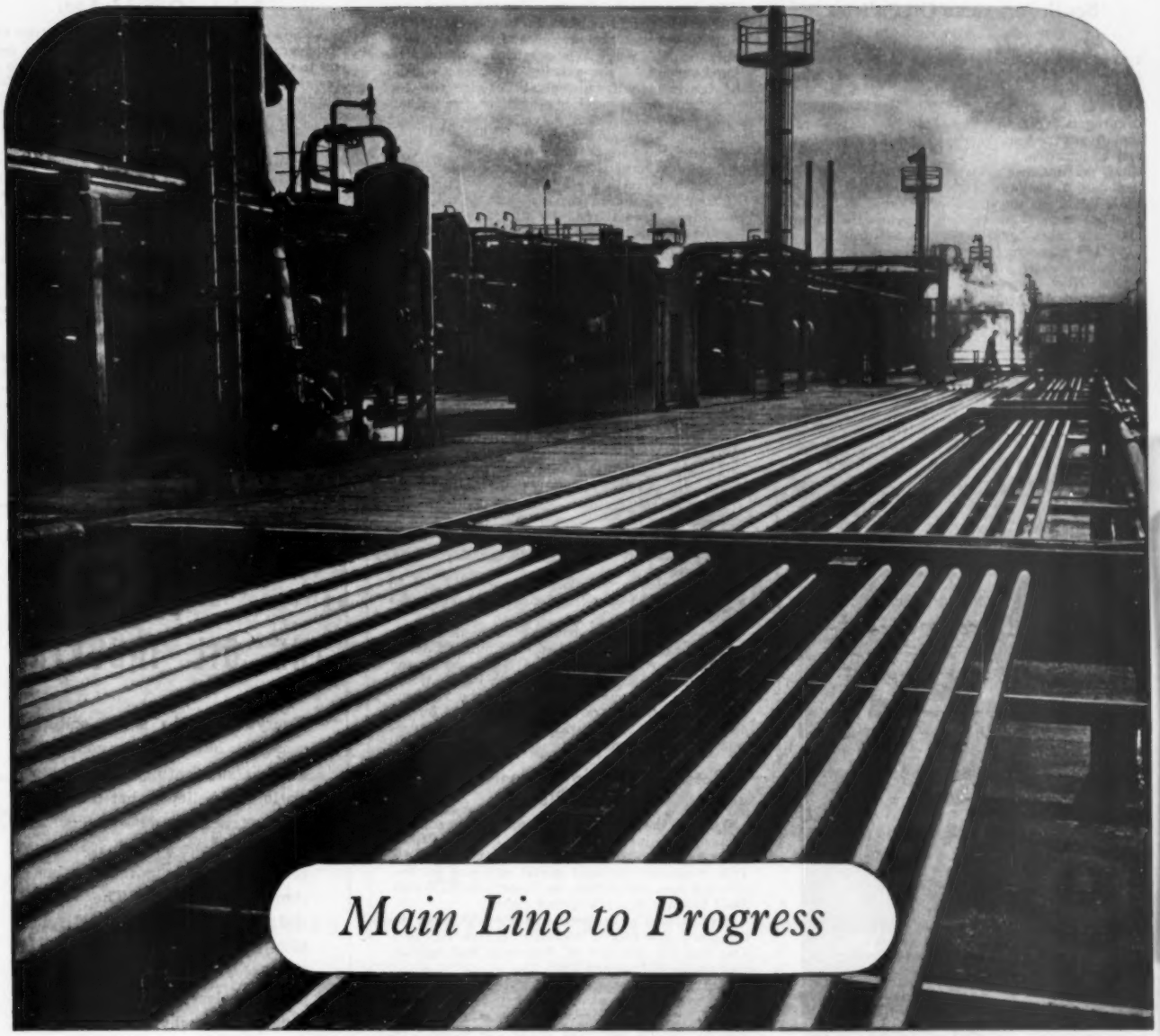
Aden is on the direct route from Anglo-Iranian's Persian Gulf sources of supply to African and Eastern markets which are showing a steadily increasing demand. The site proposed for the plant is at "Little Aden," six miles across the bay west of Aden town. Sufficient land is available and a sea channel can be dredged and jetties built to accommodate the largest tankers now afloat.

Of importance is the fact that a source of supply of fresh water has been discovered at an economic distance. The Aden government has co-operated fully with the company's survey parties which have visited the colony in recent months. The estimated cost of the refinery is between 40 and 50 million pounds sterling ($112 to $140 million) and it will take about two years to build.

Manufacture of Petroleum Equipment

There is no slackening in the amount of orders placed in the United Kingdom for petroleum equipment both for export and home service.

The total value of orders placed in 1951 was £83,991,400. Orders placed during the first three months of 1952 amounted to £22,468,100, and those placed during the second three months' period from April to June inclusive amounted to £22,461,200, a total of £45,929,300. These figures do not include the orders placed for tankers and other shipping which show no signs of regression.



Main Line to Progress

THE traffic on these lines is non-stop, night and day—for these are oil lines in one of the four Anglo-Iranian refineries in Great Britain. By 1953, these four refineries will be producing at the rate of some 230,000 barrels of petroleum products a day. Overseas, throughput in the group's eight other refineries is also being steadily and considerably increased, and plans are now progressing for the construction at Fremantle, Western Australia, of another new refinery, with a projected daily capacity of 60,000 barrels.

For new sources of this vital mineral Anglo-Iranian is prospecting in Great Britain itself and in such varied regions as Nigeria, Sicily and Papua.

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South American Oil Policies

(Continued from page 62)

troleum Convention in Caracas in September of last year. The Venezuelan Minister of Mines and Hydrocarbons, Dr. Santiago E. Vera, emphasized on this occasion the cordial relations existing between the oil industry and the Venezuelan government based on mutual confidence and cooperation.

Of the entire production of South America, including Trinidad, of 728 million barrels in 1951, Venezuela alone yielded 622 million barrels, or more than 85 percent, and production is expected to reach 2,000,000 b/d in the near future. Over 100 rigs are operating at present and the number of wells projected for the year exceeds 1,400. New concessions, which have not been issued since 1947, are contemplated for granting to companies not now represented in Venezuela which have applied for permission to operate there.

After a stagnation of oil development for 30 years, Peru has decided to open the country to private enterprise. The new law offers especially favorable conditions for developing the Amazon basin east of the Andes, comparable in its geological position between the Brazilian shield and the Andes ranges to the big Canadian fields of Alberta and Saskatchewan. For this region overall income tax is reduced to 10 percent for the first 10 years of exploitation and depletion allowance of 27.5 percent is admitted. Besides the improvement of the existing road, continuation of the railway from central Peru to the port of Pucallpa on the Ucayali River near Ganso Azul field is projected, which will facilitate and speed up the transport of heavy material. This will be carried as far as Pucallpa on the rivers from the Atlantic side. Construction of a Transandean pipeline to the Pacific may be facilitated by the big irrigation works now projected, which will divert rivers from the Atlantic side to the Pacific by large tunnels which could be used by the pipeline.

In the coastal region, the Sechura desert, principal oil prospect on the coast, will be divided, according to the regulations of the new law, into 11 blocks of 200-300,000 hectares each to permit the establishment of different new companies in that district. Because of its favorable location, considerable development is expected.

In Ecuador, which has always maintained a friendly attitude toward investment by outside capital, extensive exploration has been undertaken in recent years on the Pacific coast by International Petroleum Co. and in the Oriente by Shell and Standard (N.J.), but in spite of a total expenditure of more than 60 million dollars, no commercial results have been attained. Drilling in the southern province of El Oro by British interests has proved unsuccessful, touching the crystalline basement at shallow depth. Production of Ecuador has remained therefore at about 7,000 b/d.

In Colombia production increased in 1951 to about 39 million barrels. Consumption amounted to 7.6 million barrels.

Revision of the government's requirements covering exploration resulted in tripling of applications. Reversion of the De Mares concession has not altered the cooperation with International Petroleum Co., which will operate the refinery, and 18 million dollars have been granted by the company and American banks for its reconstruction and improvement.

Petroleum Derivatives Combat Locust Plague

One of the worst locust plagues in living memory has just been overcome in Iraq by the prompt action of the local government authorities. This campaign included aerial spraying of the infected area by Aldrin, an insecticide to which Shell has sole manufacturing rights.

Originating in Ethiopia and Somalia early in the year, the plague swarmed across the Red Sea, and by the end of February had spread over southern Iraq and Iran.

Control operations, of which there were two kinds, were started at once. Ground control was initiated by the Iraq government with the use of ground baits. In areas where this would have been difficult or impossible, arrangements were made for aircraft to spray 60 percent Aldrin emulsifiable concentrate from the air, the pilots and aircraft being supplied by the United States government under the Point Four program.

This aerial spraying proved completely effective, and in the regions lying alongside the Tigris, where aircraft spraying was the only practical method of attack because of the dune vegetation, the locusts were entirely eradicated after two days' work, the ground being covered with dead locusts, in some places to the depth of 3-4 inches. The spray not only exterminated the third and fourth stage hoppers, but was effective against a new invasion seven days later. While the aerial spraying produced spectacular results, the main instrument of control was the use of poison bait on the ground.

Iraq spent $700,000 on the project, but it is estimated that crops valued at more than $70,000,000 were saved for the national economy.

Lobitos Oilfields Ltd.

Lobitos Oilfields Ltd., which operates the Cia. Petrolera Lobitos in Peru, has doubled its capital to two million pounds sterling, capitalizing its reserves of the share premium account. Dividend amounts, as regularly in former years, to 22½ percent, including a bonus of 7½ percent. Gross profits on the former capital of £1 million amounted to £899,657, after deducting depreciation, tanker repairs, and general expenses, augmented by £44,158 of profits on the sale of investments. Income and profit taxes reached the sum of £593,189, according to the last annual report.

Production increased, especially from the southern field near Lobitos, from the Parinas sandstone by the development of two new pools. A number of new wells were shut in awaiting the arrival of equipment for repressuring, indispensable for a better recovery and conservation of the field, neglected completely so far.

The joint development by International Petroleum Co. in the boundary zone has been extremely successful, yielding a production of around 800,000 barrels. In addition, a new agreement has been entered with International for joint development of an area between the Lobitos and El Alto fields.

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Everybody talks about selling more oil, but hardly anyone has done it successfully. Customers no longer believe what oil companies tell them about the value of oil. Now, at last, a nationally famous outside authority has come to our help. The April 1952 edition of POPULAR MECHANICS, in an article, WHEN TO CHANGE OIL, explains in clear, simple style with illustrations why the motorist should change his oil every 1,000 miles. We secured the right to reprint this article. When our station men handed customers reprints our oil sales skyrocketed and are still climbing. We supplied reprints to other companies who have had amazing results. We are supplying these reprints *as a service to our industry.*

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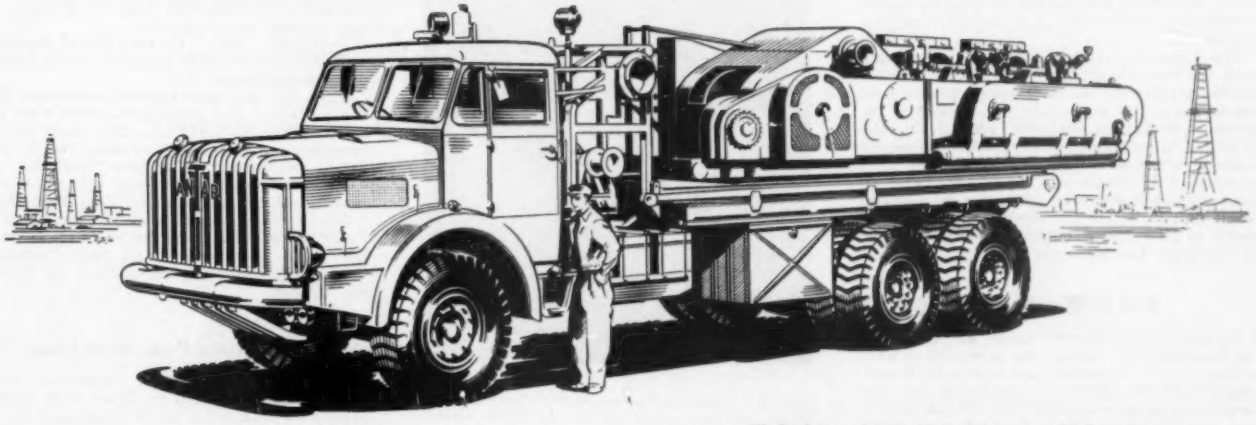

"Mighty Antar" 25 ton self loading oilfield truck. One of several shipped to Sarawak and Venezuela for Shell.

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INTERNATIONAL NEWS AND NOTES

Mercedes Shows Gain

Sociedad Anonima Petrolera Las Mercedes, associated with Texas Company in the operation of oil-fields in Guarico (owned 50-50 by Texas and Caracas Petroleum), made an operating profit of $1.25 million in 1951 and became a Venezuelan income-tax payer for the first time. Operating charges of $20.7 million balanced receipts from sales of crude, but pipeline transportation and handling charges brought in an income of $1.1 million and receipts from sales of refined products came to $214,000. Gross operating income was $22 million, as compared with $19.5 million in 1950.

The improved financial results are founded mainly on increased production, according to Sir Edwin Herbert, chairman of Ultramar. Average rate of production during 1951 was 23,176 b/d, an increase of 4,556 b/d over 1950. The current rate is just about 26,000 b/d. The increased production has come mainly from the development of a new area, (M-210) east of the Mercedes fields, discovered in January 1951.

A short distance to the east-northeast of the M-210 area a successful well was drilled on what appears to be a new structure which will receive further attention. Far to the east-northeast of the existing fields, 30 miles from Mercedes camp, a new field has been discovered which cannot be evaluated until the next dry season. The two existing producing wells have been shut in until more work indicates that a pipeline connection is justified. A southeast extension to the Palacio field has been discovered, though probably only a small one, and north of the Mercedes field, on the Matadero property, an excellent producing horizon has been uncovered in the overlying Tertiary while in the course of working over a deep well. This will call for further drilling.

In general, there has been an increase in emphasis on oil production from lower sands in the Tertiary and in the Cretaceous, corresponding to the general tendency to explore the deeper formations. While there are divergent views as to the best and most economical methods of exploration, a program covering the next 18 months has been settled. The area is intricate to explore in detail. The seismic method has shown up certain structural features around the Mercedes camp upon which exploration has, to date, mainly been based. In future, a combination of all available methods will be used.

The Ultramar chairman further stated that, with gas reserves over and above those required for oil production, Mercedes would probably be piping gas to the large cities of Caracas and Valencia, if funds were available. As it is, SAPLM is selling large quantities of gas to Venezuelan Atlantic, which put such a gas line into operation recently. The arrangement between the two companies, which includes an option for Mercedes to invest in a section of the pipeline venture, is expected to grow into an important source of revenue for SAP Las Mercedes.

Aid To Yugoslavia

Statistics show tripartite aid to Yugoslavia for the economic year 1951-52 has amounted to $120 million (U. S. 65 percent, Great Britain 23 percent, France 12 percent). Included in raw materials purchased were more than 400,000 tons of raw gasoline, over 17,000 tons of engineering grease, and a large quantity of crude oil.

Montenegro Discoveries

Two oil deposits have been discovered in Buljarica, in Montenegro, one at a depth of 1,600 feet and another at 1,750 feet. Drilling is continuing and additional mobile drilling equipment will soon arrive to step up operations.

Stanvac's Indian Refinery

According to a recent news report, contract for construction of the refinery of 25,000 barrels daily capacity which Standard Vacuum Oil Co. is to erect near Bombay has been awarded to the Lummus Co. The plant is being built under an agreement between the oil company and the government of India and is expected to go into operation in 1955.

Large Exposition Attendance Expected

Oil men and representatives from oil producing countries are accepting invitations to the 1953 International Petroleum Exposition from almost every part of the world.

Australia, New Zealand and the new Commonwealth of Ceylon, probably the most distant of the oil producing nations, were among the earliest to reply. Many of the replies are from Latin-American countries. All are expressing appreciation of Governor Johnston Murray's efforts as ambassador from the IPE. Murray is presently touring the oil producing countries of the Carribean and Central and South America and issuing personal invitations to oil men and officials to attend the exposition.

About 20,000 oil firm representatives from every state of the union and from 50 foreign nations are expected at the oil exposition May 14-23. The 1948 exposition drew more than 15,000 oil men from every oil producing state and from 43 foreign nations.

To assure oil men adequate housing, a special bureau has been set up. Applications for hotel accommodations or housing in private homes are being accepted by the Housing Bureau, International Petroleum Exposition, 616 S. Boston, Tulsa, Okla., U.S.A. Because of the increasing number of exhibitors, about 35,000 square feet of additional exhibition grounds are being prepared and will be available by Nov. 1, and $100,000 is being spent to renovate and repair the existing facilities.

Governor Johnston Murray of Oklahoma presents Hoyt Sherman, president of the Mene Grande Oil Co., with a hand tooled invitation to the 1953 Oil Show at Tulsa. Scene is Mr. Sherman's office in Caracas, Venezuela. Gov. Murray also presented an invitation from Oil Show President W. G. Skelly to Minister of Mines & Hydrocarbons Santiago E. Vera. Gov. Murray was received by the Minister, his cabinet director, Dr. Murzi D'Alta, and Dr. Francisco Medina Olivieri, acting Director of Hydrocarbons in the absence of Dr. Gustavo Thery Fombona.

Increase Gas Usage in Venezuela

The use of formerly flared gas in the Venezuelan oilfields has been getting close study in late years. There are about a dozen pressure-maintenance, absorption and stabilization projects now operating, and their number is constantly increasing. To cite only one operator's activities in this line: Mene Grande has in operation the West Guara and Oficina pressure-maintenance plants and owns an interest in the Mulata Gas Plant. Meneg will also begin construction soon on a gasoline plant as an addition to the West Guara installation.

Engineering is in progress on a pressure-maintenance plant for the unitized Chimire field being developed also by Mene Grande, Socony, and Creole, and on another such plant for the Nipa field. Preliminary studies have been begun on a gasoline plant as an addition to the proposed injection plant at Chimire.

According to the Gaceta Oficial, the Venezuelan Atlantic Transmission Corporation (VATCORP) has been authorized to charge the following rates for gas pumped from the region of Lechoso, Guarico: to Charallave, Miranda, $7.311 per thousand cubic meters; to Santa Lucia, Miranda, $7.947; to La Guaira and Arrecive, on the coast north of Caracas, $12.609; and to Valencia, Carabobo, $15.045. This 200-mile line is the first gas pipeline in Venezuela, except for a very small system by which Shell supplies some gas to the city of Maracaibo. Initially, it is supplying industrial users. A subsidiary of Mene Grande Oil Co. was putting the finishing touches to a line from the Anaco area to Puerto la Cruz in early August, also to supply industrial consumers.

Field Extension

Petroleos Mexicanos has officially confirmed discovery of an extension of the so-called "Golden Lane," the rich oil belt which runs parallel to Mexico's Gulf Coast from the Tamiahua lagoon to Paso Real in the State of Veracruz. Tenixtepec No. 2, some 60 kilometers from Paso Real, is producing gas at 2,100 psi at a depth of 5,100 feet. Excitement over discoveries in this zone dates from early June when Tenixtepec No. 1, located about 1,600 feet from the present well, was brought in as a producer.

During the 1920's, this field proved the source of Mexico's two richest producers, Cerro Azul No. 4 and Juan Casiano No. 7.

Since the 1938 expropriation, numerous Mexican geological and geophysical crews have been reexamining this territory. One result of their investigations has been Tenixtepec No. 1, which Pemex executives refer to as a "revelation."

Wells previously put down along the same fault are Arroyo Grande and Poza Verde No. 1 which at least served to define the structure. Later Mozutla No. 1 was drilled in the center of the Lane, and finally there was Tenixtepec. Others, No.'s 3 and 4, are planned for immediate drilling.

To Extend Poza Rica Line

Mexico's new oil field at Tenixtepec, in the State of Veracruz, will be linked with Pemex's Poza Rica refinery by an oil pipeline to be constructed within the shortest possible period, it was disclosed in Mexico City by officials of the government oil agency.

Although the same sources refused to estimate Tenixtepec's possibilities until further geological information is available, existence of the plans for the pipeline's construction nevertheless indicates their optimism as to future production.

Tenixtepec is only 75 kilometers in a straight line from the Poza Rica refinery.

Make the Call... We're Ready!

Petroleum refining and chemical manufacturing are industries of almost incredible superlatives. They have spent for new facilities since 1945 a sum roughly equal to total gross plant investment for all prior years. In these accomplishments, The Lummus Company—as design engineers and constructors—was privileged to play a major role.

But the years ahead are apt to make the past look puny by comparison. This year, for example, oil companies will top 1951 capital spending by over a third—chemical companies by nearly a fifth. Preliminary plans through 1955 show little or no relaxation from this rate.

Big job? Lummus is ready—a fact you may wish to bear in mind as mounting demands challenge the already-extended organizations of petroleum and chemical companies.

Rely on the quality and versatility of the Lummus staff—on the proven ability of Lummus to handle, under one contract, the functions of engineering, drafting, purchasing, expediting, inspecting, erection and initial operation.

And—as a policy statement for the record—rely on us to recognize and accept the special responsibility of handling confidential information in accordance with your own best interests and desires.

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Hydrogenation Plant Resumes

Within a relatively short time the plant of Ruhroel GmbH at Bottrop-Welheim, Germany, will be back in operation with a crude throughput of 5,000 barrels daily. Authorization to process 250,000 tons annually as part of the petroleum program of the Federal Republic was granted early in the year by the OEEC.

Initial operation will be confined to topping Middle East crude supplied by Caltex. At a later stage Ruhroel will take up hydrogenation of the topping residue, the hydrogen required being produced by dissociation of coke oven gas. Rebuilding of the four high-pressure chambers and the hydrogenation plant will involve an expenditure of 10-12 million marks (2.5-3 million U. S. dollars).

Straight gasoline from the topping process will be treated in a reforming plant. After treatment with lead the gasoline will have an octane number of 74, thus being competitive in the market. In the reforming plant the gasoline will be desulfurized. The plant will allow a separation of the gasoline fraction up to 210°.

Crude will be delivered by tankers to Nordenham on the River Weser and will be sent from there to Essen-Karnap, the goods station of Ruhroel. Finished products leaving the plant will be transported by rail or by canal.

Ruhroel began operation as a hydrogenation plant in 1937 and during the war attained a daily production of 4,000 barrels of motor and aviation gasoline besides liquefied gas. In 1944 it was partially destroyed by bombing and ceased operation. After 1949 it was re-opened for the production of phthalic acid with a monthly output of 450 tons, which is expected to rise to 600 tons before the end of the year.

Urges New Concessions

In a long article in the leading daily of Caracas, *El Universal*, J. A. Zarraga Telleria takes the Venezuelan people and their government to task for not worrying sufficiently about Venezuela's negative policy toward the inviting of bids on new concessions. The writer points out that a highly opportune moment for opening the doors, which have been closed since 1945, would have been during this last year, immediately following Iran's nationalization of the industry, when there was a desperate urgency about filling the gap suddenly opened between supply and demand. As he points out, Canada has in five years authorized concessions over about 25 million acres, or an area ten times greater than that under concession in Venezuela after 34 years of oil activity.

Peru has just liberalized its oil policy, and Mexico is augmenting its industry, making contracts with foreign firms to explore and develop. The finding of new reserves in Venezuela has not kept pace with production, he says, since proven reserves are only 1.5 times greater than they were seven years ago, while production is 2.5 times greater (6.7 million barrels of reserves vs 702,000 b/d production in 1944; 9.5 million barrels vs 1.7 million in 1951). He concludes by expressing the belief that expansion of the industry now (i.e, by granting new concessions), and "sowing the petroleum" to create new sources of wealth, would be preferable to handing over large untouched reservoirs of oil to a posterity which will perhaps have to make its way in a world which has turned to other sources of energy.

Soviet Says Oil Output Ahead of Plan

Announcement in Moscow in connection with the August survey of Soviet industrial progress asserts that by the end of the current five-year plan in 1955, the production of oil will have reached a yearly total of 70 million tons. All statistical reports issued by Soviet agencies are stated in terms of plan fulfilment. When the setting up of a 10-year plan was made known in 1950, the goal of production was stated as 60 million tons yearly by 1960. A yearly out turn of 70 million tons would call for a daily production of roundly 1,360,000 U. S. barrels, which is substantially above the estimates of independent statisticians which vary from 860 to 920,000 b/d.

Approve Mexican Contracts

Petroleos Mexicanos is within its legal rights in signing percentage-of-production contracts with foreign oil companies, according to a decision handed down by Mexican Federal Attorney-General Luis F. Canudas Orezza in Mexico City. The decision was delivered in response to charges by outgoing Mexican Congressman Natalio Vazquez Pallares that the contracts violate the Mexican Constitution and the national petroleum law.

Canudas Orezza held it is "beyond all discussion" that Petroleos Mexicanos is legally entitled to enter into such contracts under Article 47 of the current (1941) petroleum law. His ruling, in effect, legalized contracts already signed with Gustave A. Wiegand, Thomas Williams, Abraham Haber, Daniel Lazo Guinchart, Edwin W. Pauley, R. B. Byrd, William L. Smith and Juan de la Garza Hagelsiv, as well as the following companies: Inversiones, S.A.; Signal Oil and Gas Co.; Mexican-American Independent Oil Co.; and The Compania Perforadora del Golfo, S. de R.I.

A supplementary statement by Pemex pointed out the foreign companies are engaged in drilling of wells, execution of a part of Pemex's exploration projects, and part of the geological and geophysical work in connection with the search for new reserves.

The government oil agency emphasized that the contracts contain "fundamental" clauses providing that the contractors recognize "that in no case and for no reason can they contend, or have any right to (oil) lands, fields, products, constructions, direct or indirect installations related with the contracts."

Newland Joins Trafford Associates

J. B. Newland has joined the firm of Trafford & Associates, Calgary, Alberta, as a senior geologist, and K. R. Stout, exploitation engineer, has been made a junior associate.

Mr. Newland spent a number of years as subsurface geologist for Cities Service in the Permian Basin in West Texas and New Mexico. After his war service, he joined Imperial Oil Ltd. at Calgary, working with various problems in sub-surface geology and stratigraphy, remaining with Imperial until joining Trafford & Associates.

Mr. Stout started his oil field training with D'Arcy Exploration Co. Later he joined the Shell group and saw service in England, Holland, Trinidad, and Canada. He resigned in 1951 to join Trafford & Associates.

Gas Chemical Plant

In accordance with the provisions of a recent long-range economic collaboration agreement between Romania and Hungary, the two countries have established a joint Romanian-Hungarian corporation called "ROMAGGCHIM," for the purpose of setting up a natural gas chemical combine.

It is planned to build a pipeline to pump Romanian gas to a chemical factory which will be built in Hungary. At the same time, this pipeline will supply gas to certain regions in Romania.

Presents Service Awards

At a recent dinner in Red Deer, Alberta, Opie Dimmick, president of Century Geophysical Corp. of Canada, presented three and five year service pins to 18 employees of the company. The Canadian company was recently organized as a wholly-owned subsidiary of Century Geophysical Corp. of Tulsa. Century is one of the oldest operating companies in the Canadian area.

Dedicate New Canadian Refinery

Canadian Oil Companies, Ltd., celebrated its 50th birthday on Sept. 25 with formal opening of its new $23 million refinery at Sarnia, Ont. Oil men from Canada and the United States and public officials were taken by special train from Toronto to the refinery for a tour of the new plant.

The new refinery actually has been in full operation for several weeks and some units have been in service since early spring. A complete description of the plant by E. A. Smith, manager of manufacturing for Canadian Oil Companies, and F. J. Maslyk, project engineer for Stone and Webster Engineering Corp., was published in the May issue of WORLD PETROLEUM, about the time the plant first began partial operation.

Start of production at the new refinery transfers the major refining activities to Sarnia from the firm's 50-year-old Petrolia refinery which had only one-seventh the capacity.

The new refinery tops a $27 million post-war expansion program. Last fall a $2 million lubricating oil and grease manufacturing plant went into operation at Montreal. A little earlier new modern distribution facilities were provided in Edmonton. A $350,000 marine terminal is nearing completion at Parry Sound to extend the firm's chain of Great Lakes and Ocean terminals, among which are Fort William, Toronto, Hamilton, Quebec and Montreal. Many new service stations have been built and modernized.

The new refinery is designed for maximum production of quality motor fuel. Vacuum distillation equipment has been installed to produce charge stock for Ontario's first fluid catalytic cracking unit. The orthoflow cat cracker is supplemented by a phosphoric acid polymerization unit.

Low octane naphtha is reformed at the Canadian Oil Companies plant in the first UOP Platforming unit built outside the United States. Capacity of the catalytic reformer is 3,800 barrels daily. A combination of catalytic cracking, polymerization and Platforming is giving Canadian Oil Companies a gasoline with an octane number in the vicinity of 90.

The new Sarnia plant is supplying butylenes to the nearby synthetic rubber plant and other tail gases to an adjacent petrochemical plant. Propane is being recovered for LPGas sales. Special defense products include jet fuels and aviation gasoline.

Construction work on the new plant was begun in December 1950, and the cat cracker went on stream in April of this year. Capacity of the plant is 20,000 barrels daily. Crude is brought in from the Redwater field by pipeline and tanker.

Night view of new Canadian Oil Companies refinery. Cat cracker is at left, crude unit in center and Platformer at right.

Venezuela Drilling Operations

Drilling rigs in operation in Venezuela are up about 25 percent over last year. There were 116 rigs making new hole in July. Wildcat rigs on new-field and new-pool tests accounted for 30 percent of the total, or 34 rigs. Biggest wildcatter was the Mene Grande, with nine rigs on exploration out of a total of 35. Next was Shell, with eight out of 30, followed by Creole, with seven out of 21. Texas-Mercedes was operating a total of nine rigs of which four were wildcats; Socony had six with one wildcat; Phillips had five (three exploratory); Sinclair five (one exploratory); Richmond three, no wildcats; and BCO and Atlantic one each.

There were 36 geological and/or geophysical parties in the field as July began, as compared with 38 during June and 34 in July a year ago. The onset of the rainy season brought about the reduction from June.

Falcon, where no sizable field except Cumarebo has yet been found, was the scene of greatest activity, three companies operating units there for a total of seven party-months. Monagas, Anzoagtegui and Barinas were worked a total of four party-months each. In Barinas, where the terrain is exceptionally difficult owing to the many rivers, the companies or their contractors were combating the wet season by setting up their stations along the swollen streams and operating entirely from boats. Marine Geophysical was doing an overwater seismic survey in the Gulf of Venezuela and around the other (Eastern) side of the Paraguana Peninsula for the joint account of eight companies.

Vancouver Refinery Expansion Contract Let

A contract for the $10 million expansion of the Vancouver refinery announced by Shell Oil Company of Canada has been made with Fluor Corp., according to Shell officials. It is planned to commence work on the new addition early this fall for completion late in 1953.

Oil for Israel

Reports from Tel Aviv state that the Israel Fuel Corporation has entered into an agreement for the purchase of 200,000 tons or more yearly of crude oil to relieve the shortage of petroleum products in Israel. Six million dollars are said to have been made available for purchases and contracts are reported to have been placed with the American Palestine Trading Corp., American Israel Petroleum Corp. and Overseas Discount Corp.

Israel Fuel Corp. is proceeding with the construction of storage facilities, pumping equipment and service stations. Under Point Four, it has been provided with a technical expert for directing this work. The company is now engaged in a deal involving the purchase and refining of Venezuelan crude which is being treated at the Haifa refinery.

It is understood that the company is to undertake the supply of 30 percent or more of Israel's petroleum requirements. These are estimated at a little over a million tons in 1952, rising to 1,875,000 by 1955 of which Israel Fuel Corp. is scheduled to supply a quantity increasing from 120,000 tons this year to 560,000 tons in 1955.

Saskatchewan Oil Board

Appointment of a three-man Oil and Gas Conservation Board to assist in the administration of Saskatchewan's growing oil boom has been announced by Resources Minister J. H. Brokelbank.

Chairman of the board will be C. A. I. Hogg, deputy minister of natural resources. The other two members are from the University of Saskatchewan: Dr. J. W. T. Spinks, dean of the college of graduates and one of Canada's leading scientists; and Professor F. H. Edmunds, professor of geology.

The Saskatchewan board will investigate and advise the minister of natural resources on specific problems related to conservation of oil and gas resources. It will conduct its investigations through the medium of public hearings and will be empowered to take evidence under oath.

High Speed Drilling in Hungary

Szabad Nep reports on "High-speed Drilling of Oil Wells," in an interview with Jozsef Kiss, stakhanovite driller at the No. LX rig at Lovzszi (formerly concessioned area by MAORT).

"Drilling a 5,000-foot hole formerly had required 38 to 40 days," driller Kiss reported. "Today we can drill 5,000 feet in 18 to 19 days. The Soviet high-speed method of drilling is of the same revolutionary importance in oil production as the high-speed rough machining method in the machine industry or high-speed rolling in our roller mills. On the basis of Soviet experiences, we have, one might say, entirely changed the hitherto methods of drilling.

"To increase the speed of drilling, we formerly used six drill collars on the cutter head. Now we put on nine of them, 12 in some cases. The second condition of high-speed drilling is to increase the slush pump capacity. The third task is to take care of the cutting edge of the bit. We change the cutter head much sooner than in the old days, to keep the required diameter of the hole, making it easier to sink the casings. If the bit isn't worn it is much easier to repair. The bits were run at 60-65 rpm before. Today they are run at 80-85; in fact, under favorable conditions at 90-95 rpm.

"We must be very careful not to use indented drill pipes, or the hole will be oblique. In the old days they didn't care much about this. Today we don't even use drill pipes with a little damage on the thread ends.

"The new method of adding stands to the drill pipes takes only three minutes, where before it took 8-10 minutes. That means almost two hours are gained in a shift.

Hungarian Production

Workers of the LOVASZI Petroleum Production National Undertaking, (formerly MAORT) have produced 2,740 tons of crude oil in excess of their estimates of the first six months of this year. No. VI Brigade reported an overproduction of 60 tons, and a performance of 217.7 percent.

BOOKS

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CHEMICAL ENGINEERS' HANDBOOK—John H. Perry (revised 3rd edition, 1950)	$17.00
CORROSION (Causes and Preventions)—Frank N. Speller	$10.00
THE CHEMICAL PROCESS INDUSTRIES—R. N. Shreve	$ 9.00
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ELEMENTS OF OIL RESERVOIR ENGINEERING—Sylvain J. Pirson	$ 7.50

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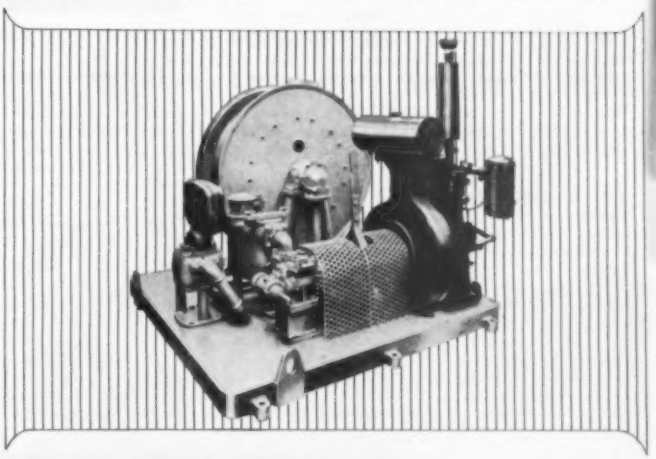

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OIL COMPANY STAFF CHANGES

KENNETH H. SHAFFER has been appointed a vice president and director of The California Company, subsidiary of Standard Oil Co. of Calif. He will be succeeded as assistant general manager of Standard's producing department by C. W. Gibbs, since 1950 manager of the department's northern California district. W. A. Eardley, previously chief petroleum engineer, will take over Mr. Gibbs' former post in Taft, Calif.

Mr. Shaffer joined Standard in 1929 and has had a diversity of experience with the company's producing, industrial relations and personnel departments and with the department on organization.

Mr. Gibbs, a Stanford University graduate, joined Pacific Oil Co. in 1922, a firm which was acquired by Standard four years later.

DR. K. A. SMITH has been appointed director of the light oils division of Sinclair Research Laboratories, Inc.

Dr. Smith joined Sinclair's research and development department in 1943 in the pilot plants section where he did much work during the war on the research and development of new aviation gasolines and in process design.

J. K. SWANSON, assistant director of mineral resources in the Saskatchewan department of natural resources, has resigned to re-enter private business. He has been with the department since April of 1949 when the province's big oil play started. He was manager of Franco Oils in Saskatoon for 10 years before joining the department.

WILBUR S. MOUNT, manager of product engineering in Socony-Vacuum Oil Company's gasoline and fuel oil department, became manager of the aviation department Sept. 1. He succeeds Warren L. Baker, who retired. Mr. Mount has devoted 20 years to the petroleum aspects of the automotive, aviation and diesel engine fields.

W. B. BERWALD, assistant chief petroleum engineer of Ohio Oil Co., has been named assistant division manager of the Shreveport, La., production division. He is succeeded by W. H. Barlow.

J. D. Anderson, manager of the purchasing department, has been appointed assistant division manager of the Houston, Texas, production division. E. W. Shoupe, in addition to his present capacity as purchasing agent, has been appointed manager of the purchasing department, succeeding Mr. Anderson. Mr. E. Loose becomes assistant manager of the purchasing department.

BURTON W. GRAHAM has been appointed director of technical service of The Davison Chemical Corp. He was formerly assistant general sales manager of the industrial chemical department, and is succeeded in that post by D. P. Barrett, formerly in charge of the company's New York sales office.

CECIL L. BURRILL has been elected a vice president and director of Creole Petroleum Corp. He returned to Creole recently after serving 18 months as director of the program division of PAD and was placed in charge of the company's New York offices.

J. E. Dyer

JAMES E. DYER, vice president and director of marketing of Sinclair Refining Co. and vice president of Sinclair Oil Corp., has been elected a director of the parent corporation. Mr. Dyer has been associated with the Sinclair companies in various sales capacities since 1916, except for two years during World War II when he was secretary of the Petroleum Industry Committee, Transportation Division.

Erratum

On Page 122 of the September number of WORLD PETROLEUM a note was published announcing new assignments for A. J. Herron and R. W. Parker in connection with the refinery to be built by Australian Oil Refining Pty. A photograph of Mr. Parker was published with the note. Unfortunately the photograph was captioned "A. J. Herron," instead of R. W. Parker.

JACK ROACH has been appointed manager of refinery operations for Kerr-McGee Oil Industries, Inc., Oklahoma City, under J. J. Kelly, manager of the refining division. He formerly was division gas superintendent for Stanolind Oil & Gas Co. at Fort Worth and previously served as assistant refinery superintendent for Phillips Petroleum Co. at Borger, Texas.

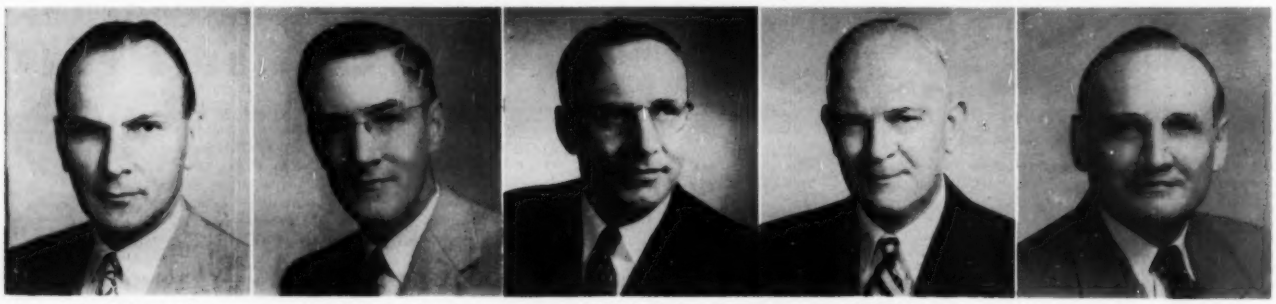
Dr. Leo Garwin has been named acting director of research for Kerr-McGee, succeeding Dr. George Agoston, resigned. Dr. Garwin has been project leader in the company's research department in Oklahoma City since June 1, 1951.

Daniel R. Ketchum has joined the company as senior construction engineer, and will assist A. T. F. Seale, chief engineer. He formerly was with the army engineers at Fort Worth.

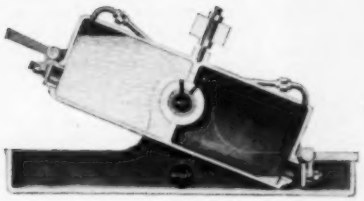
EDWARD DOLEZAL, chief mechanical engineer of Phillips Chemical Co., has been assigned to the newly-created post of chief project coordinator in a shift involving five men in Bartlesville offices. Austin Morgan, assistant chief mechanical engineer, will succeed Mr. Dolezal as chief mechanical engineer. T. M. Hipp, presently on special assignment on an ammonia plant construction near Houston, Texas, will be transferred to Bartlesville and assigned to the newly-created post of chief construction engineer. M. W. Bennett, office manager, will be assigned to the newly-created position of chief economics engineer, and M. W. Monk, assistant office manager, will succeed Mr. Bennett as office manager.

ARTHUR H. BOULTBEE has been appointed manager of manufacturing research for Shell Oil Co. to succeed D. L. Yabroff who is returning to Shell Development's research laboratory at Emeryville, California, as associate director in charge of chemical products. Dr. Boultbee joined Shell as a chemist at Martinez refinery in 1935. Since then he has served at Shell's other California refinery at Wilmington and in the San Francisco office. He has also had several assignments with associated companies outside the United States and has recently returned from one such assignment in England.

DR. ALBERT E. GRIFFITHS, formerly of the Socony-Vacuum Oil Co., has joined the chemical sales division of Ethyl Corp. He will supervise technical service work connected with the corporation's agricultural chemicals, including benzene hexachloride and lindane. Prior to joining Ethyl, he was group leader in the agricultural chemicals section of the technical service department of Socony-Vacuum, with which he was associated from 1945 to 1952.



W. B. Berwald | *W. H. Barlow* | *J. D. Anderson* | *E. W. Shoupe* | *W. E. Loose*



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It cannot lift its discharge (when there is lifting to be done the 'Ogden' Automatic Pump is the thing to use). But when lifting is not required this Vacuum Trap is an entirely reliable method of draining oil separators, evaporators, the low-pressure stages of turbines, vacuum stoves, vacuum filter receivers, or any other apparatus under vacuum.

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Manufacturing Head for Otis

Lowell M. Wilhoit has been appointed production manager of Otis Engineering Corp., manufacturing affiliate of Otis Pressure Control.

Mr. Wilhoit was general sales manager for the pressure control company prior to his assignment to the engineering post. He has been with Otis for more than 17 years and was superintendent of four divisions before being sent to the company's home office in Dallas as chief engineer several years ago.

Turner G. Garwood has been made sales manager for Otis Pressure Control at Dallas. He was previously in the Otis Houston office as senior engineering consultant for the Gulf Coast area.

Donald F. Taylor has been promoted to manager of Otis' special service department. Formerly an engineering consultant for the company, his new duties will place him in charge of the engineering and installation of pumps, packers and other special equipment.

K. W. Robbins, formerly chief corrosion analysis engineer in the calipering department of the Houston office, has been transferred to Dallas as an engineering consultant.

Opens Consulting Offices

H. J. Struth, petroleum consultant, has established office headquarters in the Kirby Building, Dallas. He will specialize in economic research, the preparation of informational publications, and serve as advisory counsellor on matters pertaining to petroleum industry economics and fact-founded public relations.

During the last two years, Mr. Struth has been spending much of his time in South America as economic counsultant to the Venezuelan Government in connection with petroleum development in that country. He compiled the first annual report of the Venezuelan oil industry, "Anuario Petrolero de Venezuela," which was presented by the National Petroleum Convention in Caracas last fall. Early this year he wrote a series of articles for WORLD PETROLEUM.

R. E. Hensley

Cooper-Bessemer Expands Tulsa Office

Robert E. Hensley has been transferred to Cooper-Bessemer's Tulsa office to assist Byron L. Potter, branch manager. Mr. Hensley will concentrate his efforts on engineering the installation of diesel engines, gas and air compressors for pipe lines, refineries and chemical plants in the Oklahoma area.

Allspeed Motor Drives

Allspeed Motor Drives of from ⅛ to 7½ hp are described in a 16-page bulletin published by Worthington Corp., Harrison, N. J. Described and pictured are both upright and horizontal drives of either closed or skeleton types. Selection tables and data on operations and maintenance are included. Dimensions and line drawings on the various drives are also featured. Requests for the bulletin should be on company letterhead.

Tidewater To Use AC-DC Drilling Rig

Tidewater Associated Oil Co. has ordered an all-electric AC-DC drilling rig for use in its Ventura field near Los Angeles, Calif. Westinghouse will supply the electrical equipment for the rig, which is designed for drilling to depths of more than 15,000 feet.

The equipment consists of a portable power substation, four 250-kw motor-generator sets for converting alternating current to direct current, an 800-hp drawworks motor, two 550-hp and one 100-hp mud-pump motor, and complete AC and DC controls.

Reassigns Vice Presidents

Re-assignment of Halliburton Oil Well Cementing Company's three regional vice presidents is announced by L. B. Meaders, vice president for field operations.

Harry P. Conroy transfers from the southern to the northern region; Fred R. Whitten transfers from the northern to the central region; and R. G. Kelly transfers from the central to the southern region.

Changes are made to acquaint them with all domestic operations. Headquarters for the three men will continue to be at Duncan home offices. Duties in the new assignments remain the same.

Alco Products Movie

"The Alco Products Story" is a new industrial movie based on the development and manufacture of products for the oil, chemical and power industries produced by the Alco Products division of American Locomotive Co. The film demonstrates engineering and production teamwork in all stages of manufacture. It describes how products are developed and how facilities, machines and manpower are coordinated for efficient output. Prints of the 16mm. film will be available to business groups and professional engineering societies on request to American Locomotive Co., Schenectady 5, N. Y.

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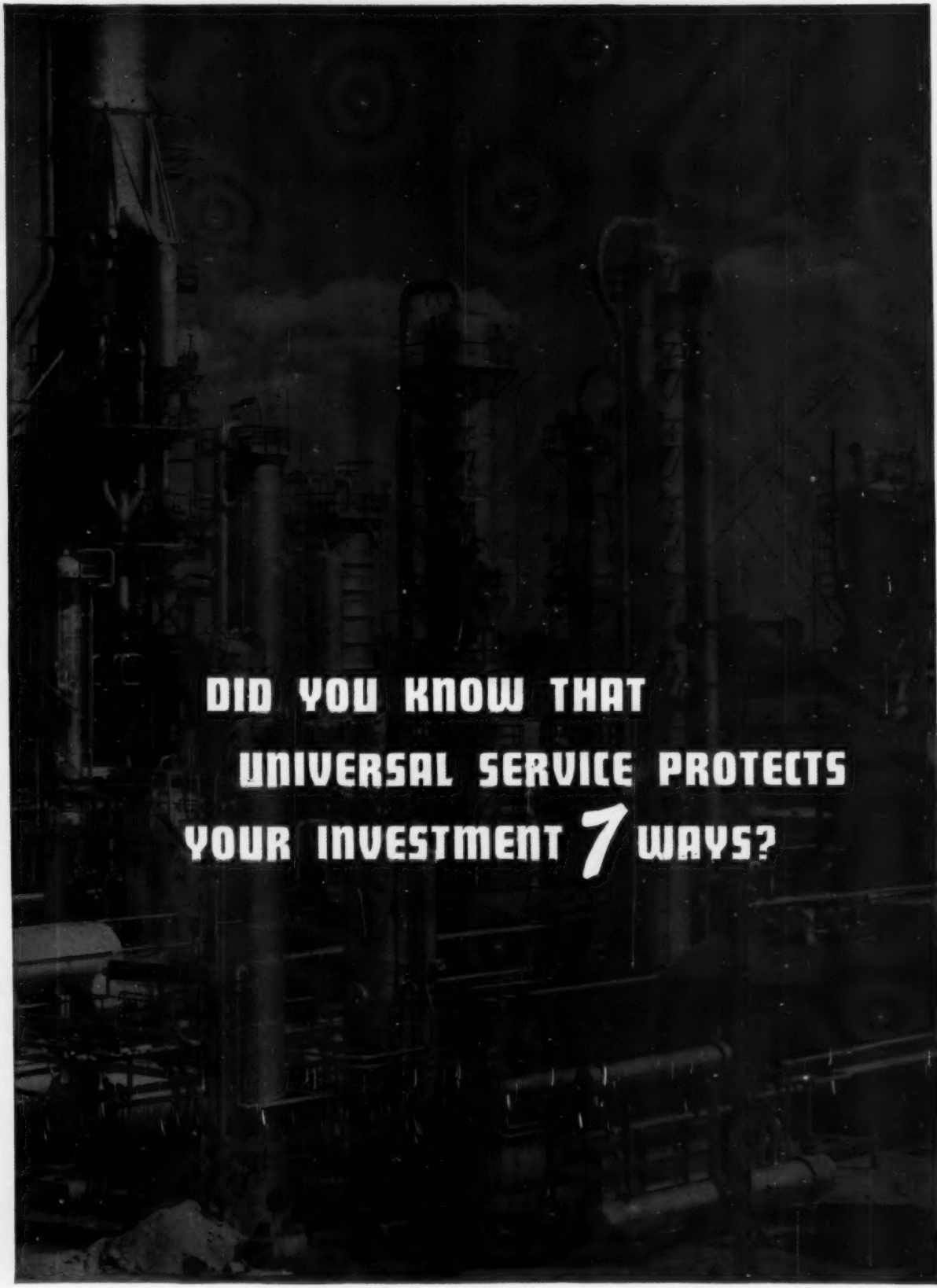
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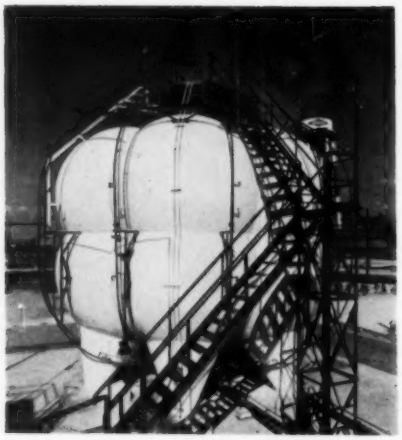


The Multisphere has been developed by Chicago Bridge & Iron Co. for the bulk storage of high vapor pressure products, particularly in the petrochemical and LPgas fields. The first such commercially installed tank, pictured above, was built for Dow Chemical Co. at Freeport, Texas. It is a 2,500-barrel tank used for the storage of methyl chloride. The tank consists of 14 interconnected spherical segments and is designed for operating pressures of 150 psi.

Fluor Awarded American Liberty Contract

D. R. Zachary, executive vice president of American Liberty Oil Co., Dallas, Texas, has announced that The Fluor Corp., Ltd., Los Angeles, Calif. and Houston, Texas has been awarded the engineering and construction of a feed preparation unit, TCC unit, gas fractionation unit, and the modification of the existing poly plant for the refinery at Mt. Pleasant, Texas. All engineering for these new facilities will be performed by Fluor's Mid-Continent division at Houston.

Heads Blaw Knox Tulsa Offices

Chemical plants division of Blaw-Knox Co. has expanded its Tulsa, Oklahoma, office into a complete operating unit and has appointed F. Drake Parker its manager.

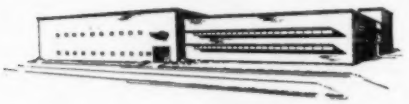
Mr. Parker will direct a staff which includes some 100 engineers. He came to Blaw-Knox from the Badger Process division of Stone & Webster Engineering Corp., where he has been chief process engineer. Earlier in his career he was a western representative of the Houdry Process Corp., chief process engineer of the Bechtel Corp., and research supervisor of the Union Oil Co. of California. During World War II, he served in the refining division of the Petroleum Administration for War.

F. D. Parker

Halliburton Builds Technical Center

Work was begun Sept. 8 on Halliburton Oil Well Cementing Co.'s new technical center at Duncan, Okla., President W. R. McClendon announced. The six-acre technical center will house Halliburton's engineering laboratory and research facilities. Over 100 engineers, chemists and other technical personnel will transfer to the center when it is completed.

The first structure at the center will be the engineering laboratory building. The building will be an air-conditioned, two-story brick structure. The south wing will be especially designed for chemical research. First floor rooms include electrical engineering, bulk cement engineering, cement-hydrafrac laboratories, and administration offices. The second floor will have organic and analytical chemistry laboratories, conference rooms, technical library, general engineering, and physical chemistry laboratories.



Architect's conception of the Halliburton Oil Well Cementing Co.'s engineering laboratory building at the new technical center, Duncan, Oklahoma.

Jerald Alliger

Opens Calgary Offices

Geophoto Services, Denver consulting firm specializing in photogeologic evaluation, has recently opened offices in Calgary. Jerald Alliger, who has been with the firm since 1946, has been named manager of the Canadian office. He will be assisted by Bruce Coombs and Richard Bryson who have been transferred from Denver, and J. W. Antal, recently with Denton-Spencer Co., Ltd., in Calgary. Robert McCulloch is on temporary assignment from Denver to Calgary as research geologist.

Two New Schlumberger Divisions

Paul D. Chabas, area manager of Schlumberger Well Surveying Corp., Denver, Colo., has announced the formation of two new divisions in the Rocky Mountain area. R. P. Burton and C. A. Rosenthal have been appointed division managers. Mr. Burton heads the southern Rocky Mountain area with headquarters in Denver and district offices in Farmington, N. Mex., Sidney, Nebr., and Vernal, Utah. For the past two years Mr. Burton has worked as assistant to the area manager in Denver.

Mr. Rosenthal has been appointed northern Rocky Mountain division manager with headquarters in Casper, Wyo. and district offices in Casper, Cody, and New Castle in Wyoming; Glendive, Montana; and Williston, N. D. He was formerly district manager at Oklahoma City and since November 1950 has been district manager at Wichita Falls, Texas.

Halliburton Oil Well Cementing Co. officials inspect the site of the firm's technical center at Duncan, Okla. Left to right: Chief Engineer John Guest, Architect Frank Hogwood, Vice-President and Secretary-Treasurer Logan D. Campbell, President W. R. McClendon, and Coordinator R. M. Hansen. In the background are Halliburton Plant Two buildings.

Gas Pipe Line Construction Begun

Texas Gas Transmission Corp. has started work on a new 408-mile, 26-inch natural gas pipe line to serve 30 distributing utilities from Louisiana to Ohio. H. C. Price Co. and Houston Contracting Co. are building the line in six sections from Bastrop, La. to a point near Louisville. The project, when completed, will raise the daily delivery capacity along an enlarged 3,000 mile Texas Gas system to 950 million cubic feet.

Geophysical Gift To Rice

Donation of $25,000 by four geophysical exploration companies toward establishment of an earthquake seismograph station at The Rice Institute, Houston, Texas, has been announced by the Society of Exploration Geophysicists. The gift was made by General Geophysical Co., Independent Exploration Co., Robert H. Ray Co., and Seismic Explorations, Inc., all of Houston.

Forms Petrochemical Sudsidiary

Sinclair Oil Corp. has formed Sinclair Chemicals, Inc. as a direct subsidiary to take over the production and sales of chemicals recoverable from petroleum raw materials. John A. Scott, manager of Sinclair's petrochemical division since its inception, will be executive vice president of the new company. E. W. Isom, chairman of Sinclair Research Laboratories, Inc., will be chairman. Headquarters will be in the Sinclair Oil Building, 600 Fifth Avenue, New York.

J. A. Scott

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Liquid Weight Meter

The Weigh-O-Matic liquid meter, designed and manufactured by OMECO, Houston, provides a simple and accurate means of measuring liquids. The Weigh-O-Matic meter weighs liquids continuously in small "batches" and totals the number of these "batches" on a mechanical counter. By knowing the given weight held by each compartment of the meter, which in turn represents a given volume of liquid, the volume of liquid passing through the meter can be easily determined.

The Weigh-O-Matic can be used for measuring crude oil, salt water and brine, fresh water in water flow operations, muds and slurries, corrosive liquids, liquids containing solids that cannot be measured by other means, powders such as cement that are "liquid-like," and grain and other such small particle solids.

New Cat Cracker Planned

Standard Oil Co. of California will build a new catalytic cracking unit at its El Segundo, Calif., refinery at a cost of more than $20 million. Capacity will be 36,000 barrels.

The new unit will include a feed stock preparation unit capable of handling 54,000 barrels daily of heavy fuels. It also will include facilities to recover H_2S gas for conversion into sulfuric acid.

Sulfur Plant On Stream

Standard Oil Co. (Ind.) has started production of sulfur in a new plant at its Whiting, Ind., refinery. Most of the Whiting production of 55 tons per day of sulfur will be converted to sulfuric acid in existing plant facilities for use in alkylation and treating operations.

Lane-Wells To Award Scholarships

To commemorate its 20th anniversary of service to the petroleum industry, the Lane-Wells Co. has inaugurated a program to assist deserving graduates and undergraduates in the field of petroleum engineering. Consisting of both scholarships and fellowships, the program has been established in 11 colleges or universities in both the United States and Canada. All students in the field of petroleum engineering are eligible for an award, regardless of nationality. Schools include the University of California, University of Oklahoma, University of Texas, University of Tulsa, University of Southern California, Texas A. & M, Louisiana State University, Colorado School of Mines, Pennsylvania State College, California Institute of Technology, and the University of Alberta, Canada.

Richfield Refinery Project

A $40 million refinery expansion project to meet increased military aviation fuel requirements and the West's growing demand for gasoline has been announced by Richfield Oil Corp. The 20,000 barrel capacity increase at Richfield's Watson Refinery near Long Beach will be completed in 1954. The project includes a new fluid catalytic cracking unit which will boost total gasoline output by more than 40 percent to 65,000 barrels daily. There will also be substantial increases in the production of jet propulsion fuel. Ethylene recovery facilities will be installed.

Beckman Buys Berkeley Scientific

Assets of the Berkeley Scientific Corp. of Richmond, Calif., have been purchased by Beckman Instruments, Inc., South Pasadena, Calif. Operations will continue as the Berkeley Scientific Division of Beckman Instruments, Inc. No changes in management or personnel are contemplated. W. K. Rosenberry, founder and president of Berkeley Scientific, becomes vice-president of Beckman and will remain in charge of operations at the Richmond plant. With the addition of the new firm, the number of Beckman employees has now been increased to 1,400.

Research Engineering Manager

Ralph E. Hope has been appointed manager of research engineering of The Davison Chemical Corp., Baltimore. For the last two years he has been Davison's representative at Warrington, England, on the design and operation of a plant built by an affiliate of Lever Brothers & Unilever Ltd. for the production of petroleum cracking catalyst by the Davison microspheroidal process.

Procon To Build Shell Platformer

Procon, Inc., Chicago, has been awarded a contract for the construction of a 16,000 barrel Platforming unit for Shell Oil Co. at its Wood River, Ill. refinery. The new Shell unit is being designed expressly for the production of high octane motor fuel. Procon is also building a 16,000-barrel Platformer for Shell at the company's Houston refinery.

Ward Payne Anderson

Ward Payne Anderson, general manager of the refining division, eastern operations, of the California Texas Oil Co., Ltd., died suddenly August 12 at his home in Larchmont, New York. He had not been ill previously. He was 50 years old.

Mr. Anderson joined the research and development department of the Richmond, California, refinery of the Standard Oil Co. of Calif. in 1925. He went to Bahrein in the Persian Gulf in 1936 as superintendent of the refinery then being built there. He became general manager of Bahrein in 1942, continuing in that capacity until 1946, when he was transferred to the New York offices of Caltex. He was made general manager of the refining division, eastern operations, in 1948.

WORLD PETROLEUM OFFERS

complete accurate coverage

TAKE VENEZUELA, FOR EXAMPLE

WORLD PETROLEUM has a circulation in Venezuela of 703 copies per month (June 1952 CCA). In this important oil country, (the second largest producing area in the Western Hemisphere), WORLD PETROLEUM circulation is approximately a third as large as the entire foreign distribution of the next U. S. oil publication which offers its advertisers an audit.

WORLD PETROLEUM circulation is concentrated in the largest producing and refining companies in Venezuela. Creole Petroleum Corp., the nation's largest producer and refiner, receives 190 copies of WORLD PETROLEUM in Venezuela in addition to those copies received in New York offices. Mene Grande gets 118 copies in Venezuela. Distribution is based on lists supplied by all companies in the country.

WORLD PETROLEUM is accurately and carefully distributed among people who have the buying power in Venezuela. In producing departments, for example, WORLD PETROLEUM is read by:

39 Corporate Officers
26 Gen. Mgrs. & Gen. Supts.
44 Div. & Dist. Mgrs. & Assistants
64 Field Mgrs. & Supts.
50 Purchasing and Stores
37 Exploration, Geologists & Geophysicists
29 Chief Engineers & Assistants
85 Engineers
82 Drilling Supts. & Toolpushers

WORLD PETROLEUM

604 Fifth Ave., New York 20, N. Y.

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Evaporation Losses

Methods and equipment for preventing loss of petroleum products through evaporation are described in detail in a bulletin reprinted by the U. S. Bureau of Mines. The Bulletin, first published in 1934, has been reprinted for the second time in response to the continuing demand for information on how to minimize evaporation losses.

Copies of Bulletin 379, "Applied Methods and Equipment for Reducing Evaporation Losses of Petroleum and Gasoline," by Ludwig Schmidt, former Bureau petroleum engineer, may be obtained only from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. at 20 cents a copy. It is not for sale by the Bureau of Mines.

New Fluor Directors Elected

Election of two new members of the board of directors of the Fluor Corp. Ltd., was announced recently by President J. S. Fluor following the appointment of Franklin S. Wade, chairman of the board of directors of the Southern California Gas Co., and Dudley E. Brown, comptroller of the Lockheed Aircraft Corp.

The two community leaders will fill the unexpired terms of F. M. Stephens, vice-president of Fluor's manufactured products division, and John F. Gardner, head of the project coordination department, both having submitted recent board resignations.

Houston Nomads Meet

The Houston Chapter of NOMADS was entertained by Kraus Earhart of The Texas Company at its August meeting. Mr. Earhart delivered a forty-five minute talk on the duties of American citizenship and revealed himself as a second Irvin Cobb, which is understandable since both were born in Paducah, Kentucky.

Guests at the August meeting of the Houston NOMADS chapter were, left to right: G. B. Adlaire, C.P.C., drilling superintendent, Maracaibo, Venezuela; Kraus Earhart, The Texas Co., Houston; H. W. R. Wardlaw, Asiatic Petroleum Corp., Houston; and Arthur R. Phillips, Australasian Petroleum Co., drilling superintendent, Port Moresby, Papua. Mr. Earhart was principal speaker at the meeting.

Heads GATX Division

General American Transportation Corp. has appointed Emerson J. Lyons as general manager of its Turbo-Mixer division. Mr. Lyons succeeds James E. Moul, retired.

Simon Made Counsel for PAD

William Simon of Chicago has joined the Petroleum Administration for Defense as assistant deputy administrator and general counsel. He succeeds Elmer E. Batzell, who has returned to private practice in Washington.

Mr. Simon is a partner in the firm of Miller, Gorman, Westcott and Adams and is currently on leave. In 1948 and 1949 he was general counsel for a Senate Commerce subcommittee studying selling practices in basic industries. In 1949 and 1950 he represented the Empire State Petroleum Association and 11 other state gasoline associations in the so-called "Detroit case" involving a battle between Standard Oil Co. of Indiana and the Federal Trade Commission.

Mr. Simon is regarded as a specialist on antitrust questions and the author of a book on pricing practices as related to antitrust laws.

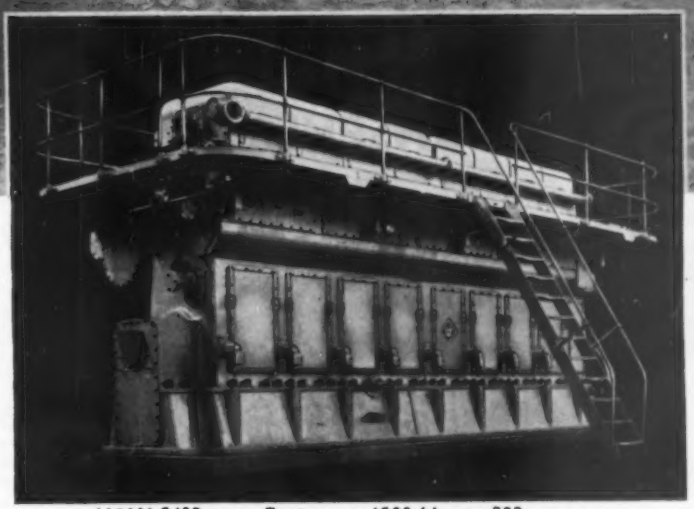
Torque Convertor Drilling Rigs

IDECO has released a bulletin describing a new Hydrair 35 series torque converter drilling rig. This new rig is designed for 350 input horsepower, and is available in single and dual engine arrangements. A special model in this series, described as the Hydrair 35-DD, is equipped with an extra large sandline drum which increases its servicing rating to a depth of 16,400 feet. Copies of the bulletin may be obtained from Department 215, IDECO Division, Dresser Equipment Co., Box 1331, Dallas, Texas.

OIL PIPE LINE

Part of one of the largest contracts for stationary oil engines ever placed in Great Britain being packed for shipment. The order, totalling some 60,000 bhp of 31SL and 40SB type engines was placed by the Iraq Petroleum Co. Ltd., following the satisfactory service of 15 H&W engines, each working for 6000 hours per annum over a period of 14 years.

Sixteen additional engines of 31SL type, for Banias, Tripoli and Basra have since been ordered by the Company.



H&W 840S type Engine 1200 bhp at 333 r.p.m.
with Exhaust Turbo-charging 1850 bhp at 333 r.p.m.

H&W

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2-stroke and 4-stroke engines for industrial, marine aux. and rail traction purposes

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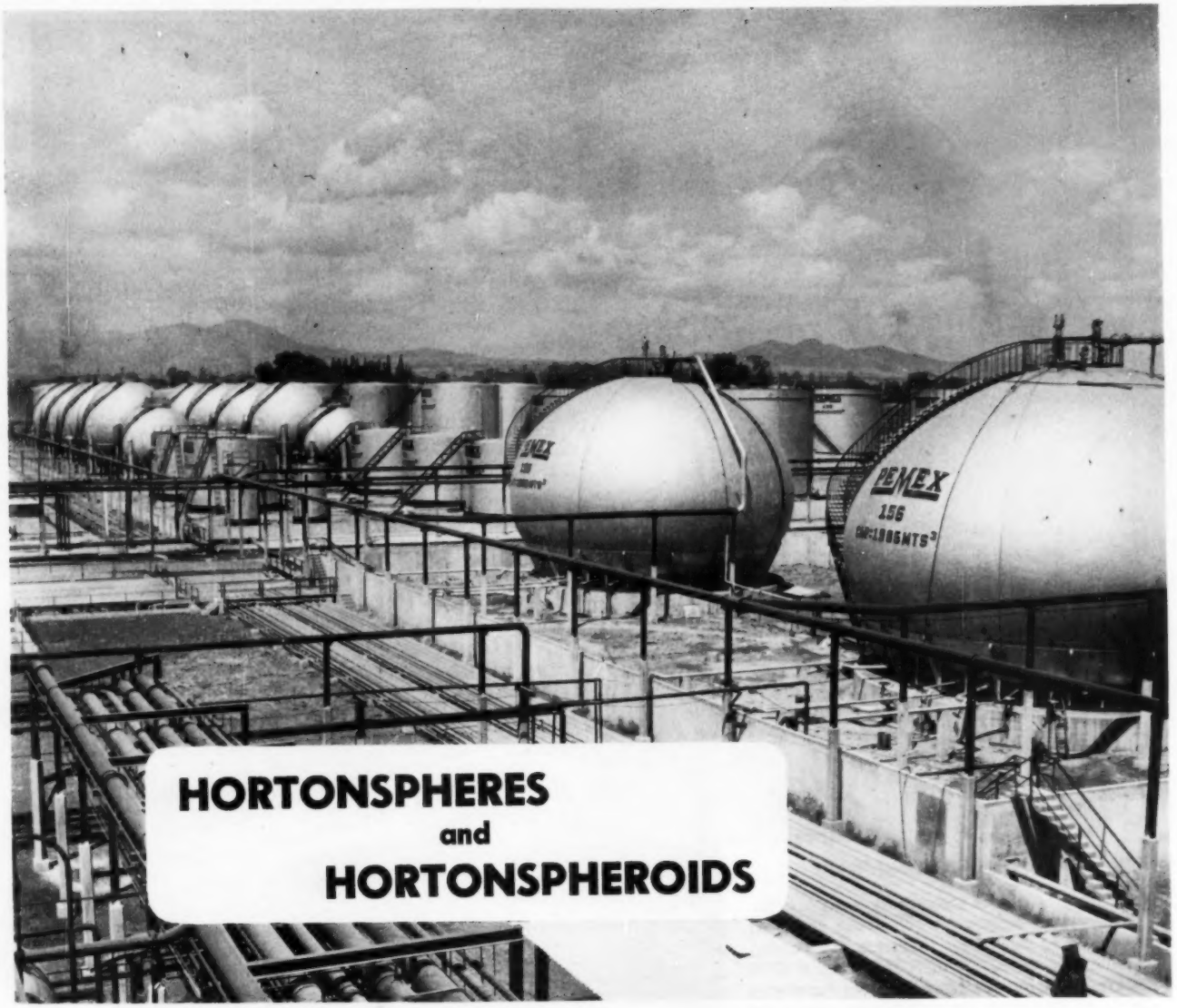

HORTONSPHERES and HORTONSPHEROIDS

provide pressure storage for Pemex

As Mexico's plans to expand its petroleum industry become a reality and an increasing number of producing wells are brought in, refinery operations and storage facilities must also be increased. Chicago Bridge & Iron Company has been helping Petroleos Mexicanos solve the problem of storing volatile liquids safely and economically in the Hortonspheres and Hortonspheroids.

Volatile liquids suffer excessive evaporation loss when stored in tanks operating at atmospheric pressure. To prevent this loss, and reduction in quality, Pemex is utilizing pressure storage . . . and when it comes to pressure storage, Hortonspheres and Hortonspheroids are superior.

The Horton tanks shown above are located at a Pemex refinery that has a charging capacity of 50,000 bbls. per day. It has 195 tanks with a total capacity of 1,654,000 bbls. operating at atmospheric pressure and a total capacity of 75,000 bbls. in Hortonspheres and Hortonspheroids storing volatile petroleum products under pressure.

Hortonspheres are designed for pressures from 25 to 250 lbs. per sq. in. These include the more volatile grades of natural gasoline, butanes, butane-propane mixtures and volatile refinery stocks. Hortonspheres are supported above the ground on cylindrical steel columns. Their shells are entirely accessible for inspection and painting.

Hortonspheroids are designed for pressures of 2½ to 100 lbs. per sq. in. They are especially well adapted for the storage of motor gasolines and natural gasolines. The smaller sizes are built with smooth shells and the larger sizes are of noded construction.

Further information concerning Horton tanks for pressure storage may be obtained by writing our nearest office. There is no obligation on your part.

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The key to this uniformity is Hughes' new method of carburizing and heat treating, employing new automatically controlled equipment and a metallurgical experience gained in 43 years of manufacturing rock bits.*

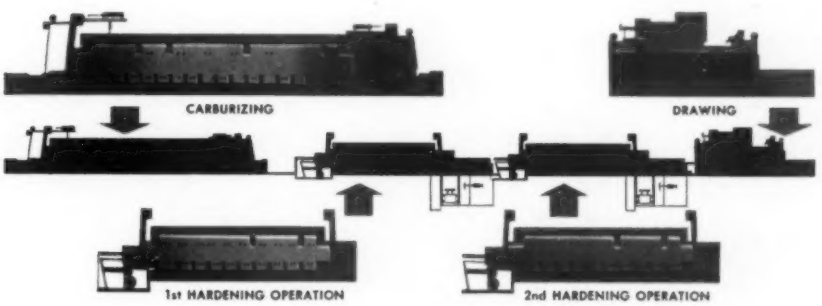
Since 1945, three heat treating furnace lines have been installed. The hardening furnaces in these lines, together with their discharge chambers for quenching, are sealed so that atmosphere as well as temperatures can be controlled.

These new furnace lines permit the desired level of carburization to be set and maintained without variance. The metallurgical characteristics of the case best suited to each size and type of bit is thus assured.

Heat treating—the refining, hardening and drawing of the steel—is done in three stages, each a continuous, automatic operation, in which every step is time-controlled.

Carburizing and heat treating as now done by Hughes, with the latest, most modern equipment available, is your guarantee that the rock bits you get will give the uniform, dependable performance for which they are designed.

*Hughes Tool Company is the largest deep case carburizer of manufactured products in the world.



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